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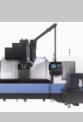
A. Turning Center

1. Horizontal TC
2. Vertical TC
3. Swiss turn type TC

B. Machining Center

1. Vertical MC
2. Horizontal MC
3. NC Boring Mill
4. Double Column MC

Vertical MC

	a Tapping Center	b VMC	c Productivity VMC	d Die & Mold VMC				e 5axis VMC				
Y travel or Rotary table dia. (mm)	DT series	DNM series	Mynx series	VC series	VM series	DVM series	NX series	FM linear series	DNM series	NX series	VC	FM linear series
												
Y travel (mm)	~ 450	DT 400 DT 360D DT 400L	DNM 400 II	VC 430			NX 4500 II	FM 400 linear				
	~550		DNM 500 II	Mynx 5400	VC 510	VM 5400 VM 560	DVM 500 II	NX 5500 II				
	~670		DNM 650 II	Mynx 6500		VM 6500	DVM650 II	NX 6500 II				
	~750		DNM 750	Mynx 7500		VM 750						
	~850											
	~960		DNM 900			VM 960						
	~1260					VM 1260						
Rotary table dia. (mm)	200								DNM 200/5AX			FM 200/5AX linear
	350								DNM 350/5AX			FM 350/5AX linear
	630									VC 630/5AX		

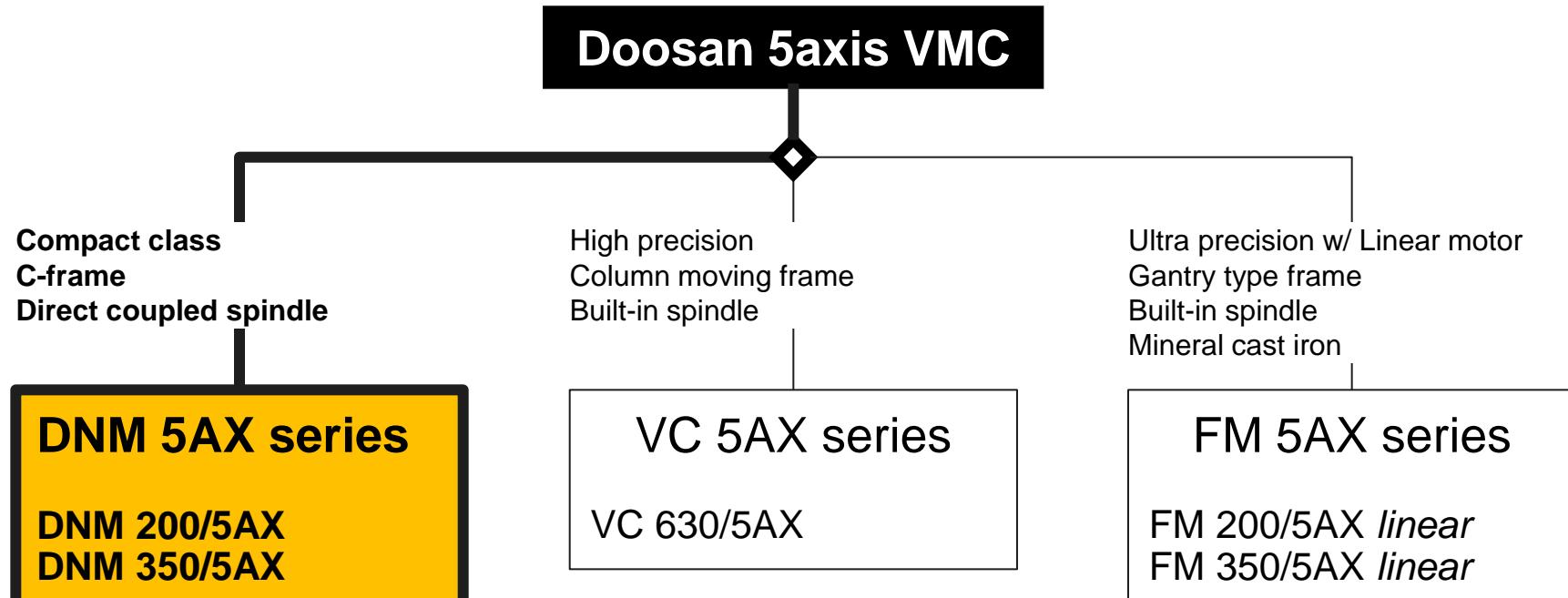
[매출실적] 전체_본사출하기준

Only reference

량	(열 1) 대지	시리즈	세부기종(小)	년도	2009	2010	2011	2012	2013	총합계
	미주	VMC-5AX	DNM350/5AX					1	4	5
			VC630/5AX			3	2	1	3	9
		VMC-5AX 요약				3	2	2	7	14
미주 요약						3	2	2	7	14
	유럽	VMC-5AX	DNM350/5AX					3	26	12
			NX500/5AX				1			1
			VC630/5AX		4	12	15	28	24	83
			VMD600/5AX		1					1
		VMC-5AX 요약			5	12	19	54	36	126
유럽 요약					5	12	19	54	36	126
	인도/기타	VMC-5AX	DNM350/5AX						1	1
			VC630/5AX				1	1		2
		VMC-5AX 요약					1	1	1	3
인도/기타 요약							1	1	1	3
	중국	VMC-5AX	VC630/5AX					1	2	3
		VMC-5AX 요약					1	2		3
중국 요약							1	2		3
	한국	VMC-5AX	DNM350/5AX					8	16	24
			FM200/5AX				1			1
			VC630/5AX		1	13	21	29	38	102
			VMD600/5AX		4	2	1			7
		VMC-5AX 요약			5	15	22	38	54	134
한국 요약					5	15	22	38	54	134
요약					10	30	44	96	100	280

e 5axis VMC

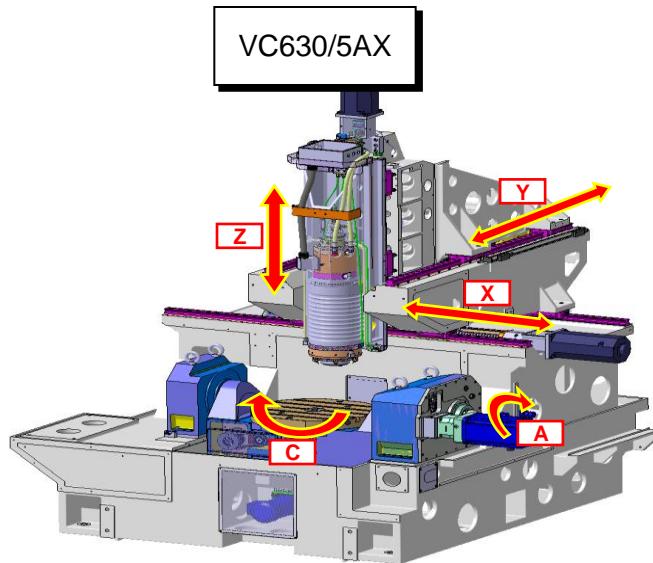
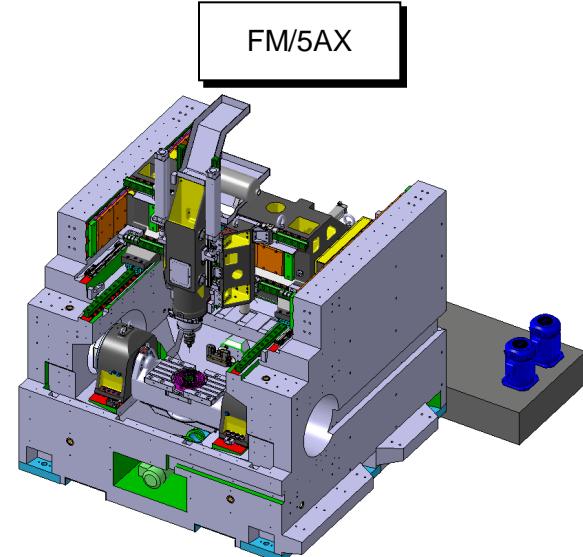
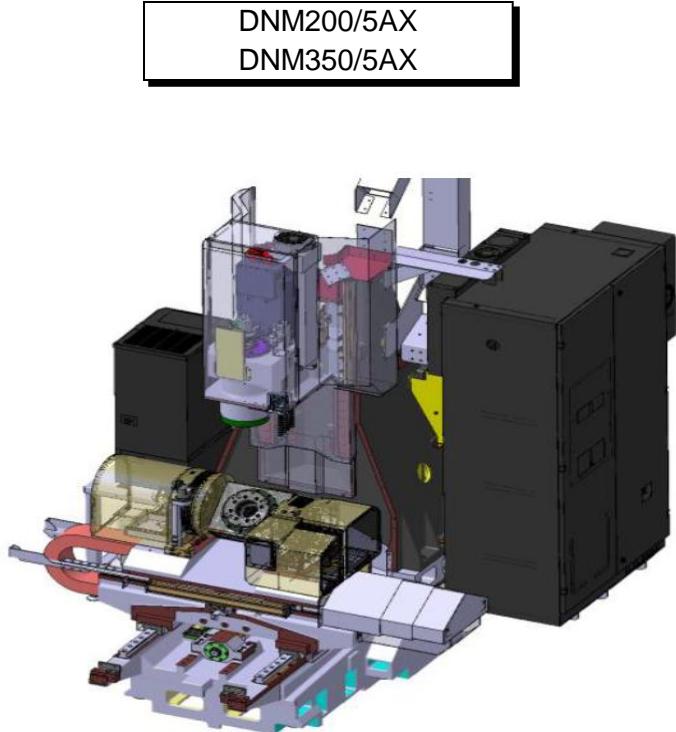
Concept...



* Direct coupled spindle from 2014
mass production plan

Structure _Doosan's 5axis VMC

Back-up



DNM 5AXIS series

Rotary table dia. (mm)	Tool taper	Non simultaneous 5AX((4+1axis))	Simultaneous 5AX	
		F0iMD	F31i5	iTNC530
200	HSK E40			FM 200/5AX <i>linear</i>
	#40	DNM 200/5AX	New	
350	#40		DNM 350/5AX	
	HSK E40			FM 350/5AX <i>linear</i>
500	#40			
630	#40			VC 630/5AX



Size ↓

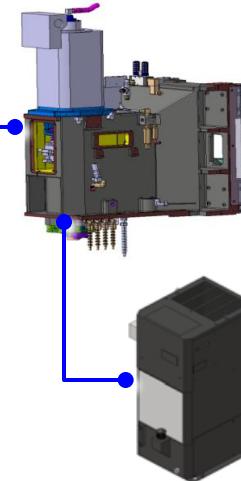
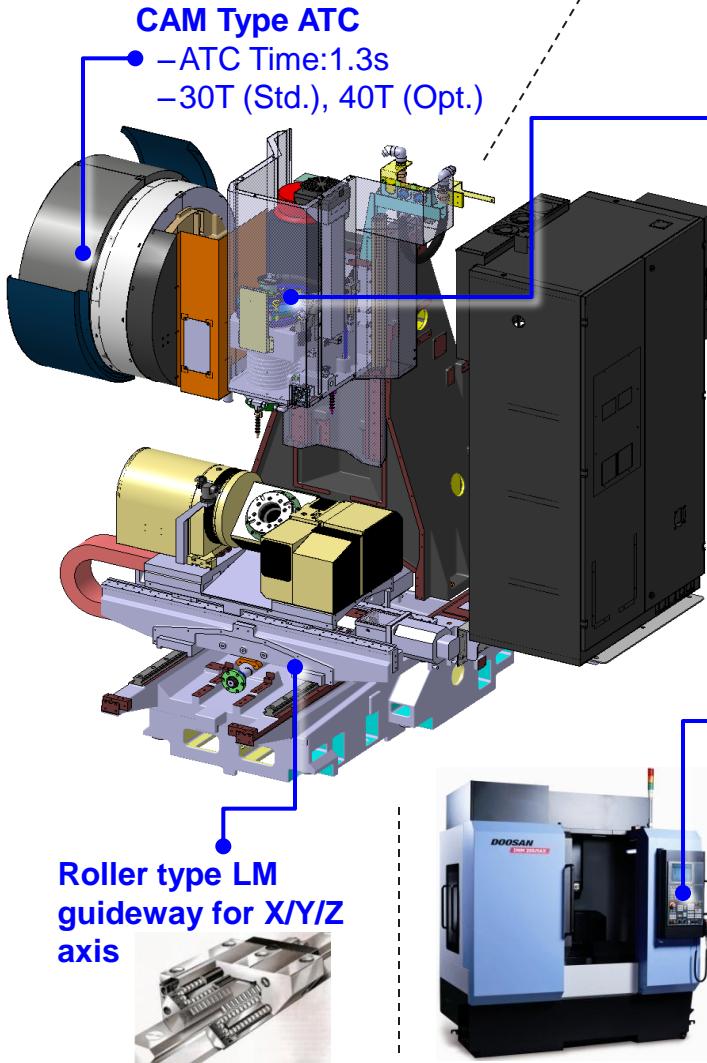
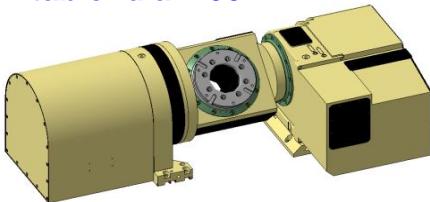
DNM 5AX series _ DNM 200/5AX New

New addition of DNM 5AX series with trunnion type rotary table for customers who require entry level 5(4+1) axis machining as a practical class

- DNM 400



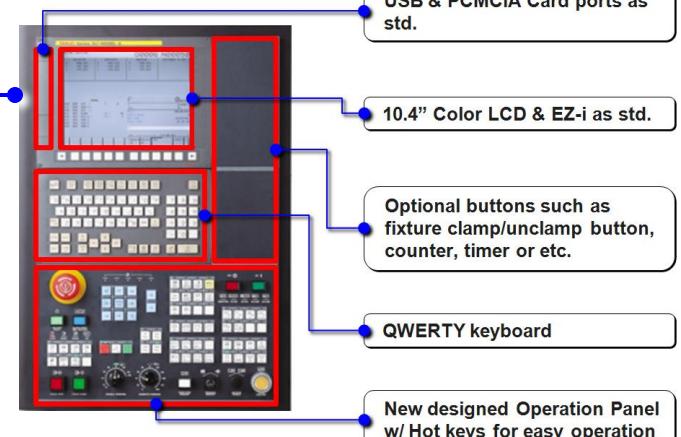
- Trunnion type Rotary table: dia. 200mm



12kr/min w/ Direct coupled spindle & Dual contact spindle as standard

Oil cooler for spindle & ball screw nut as standard

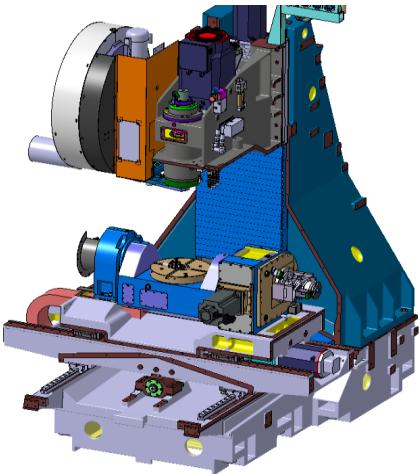
New OP for convenience



DNM350/5AX – OVER VIEW

5ax VMC for Various Application

- High performance 5-Axis VMC for entry level 5-axis machining



APPLICATION

- AUTOMOTIVE
- AEROSPACE, MEDICAL

TYPICAL WORKPIECE

- Impeller
- Manifold
- Precision mechanics



MAIN FEATURES

- ROLLER LM GUIDEWAY
- BALL SCREW COOLING
- OIL COOLER & DUAL CONTACT SPINDLE STD.
- DHC : Doosan Heat Control

COMPATITORS

- YCM(TAIWAN), MORI, OKK, MAZAK

STATUS / SCHDULE

- Proto : JAN. 2011
- MASS PRODUCTION : AUG. 2011~

DNM350/5AX – Major units & sales point (1/5)

Automatic tool length measure.

Axis direction thermal displacement compensation

TS27R (STD.)

CAM Type ATC

Linear scale (OPT.)

Slide Cover

Oil Cooler

Screw Conveyor

ATC Time:1.3s

- 30 tool
- 40 tool (opt.)

12,000r/min

- ATC Time:1.3s
- 30 tool
- 40 tool (opt.)

12,000r/min

- ATC Time:1.3s
- 30 tool
- 40 tool (opt.)

Belt → direct

Thermal symmetry Spindle head body structure.

Thermal displacement compensation equipment (opt.)

Dual contact system (STD.)

Air Blow (STD.)

Worm wheel

Roller LM Guide

High rigid structure

Minimize machining precision influence.

Direct Feed Back

Spindle head cooling system

Minimize spindle head thermal displacement.

Internal Screw conveyors for easy chip disposal

Restrain thermal deformation by coolant temp. control.

Higher load capacity

Higher damping coefficient

- Easy MQL Piping
- Better working circumstance

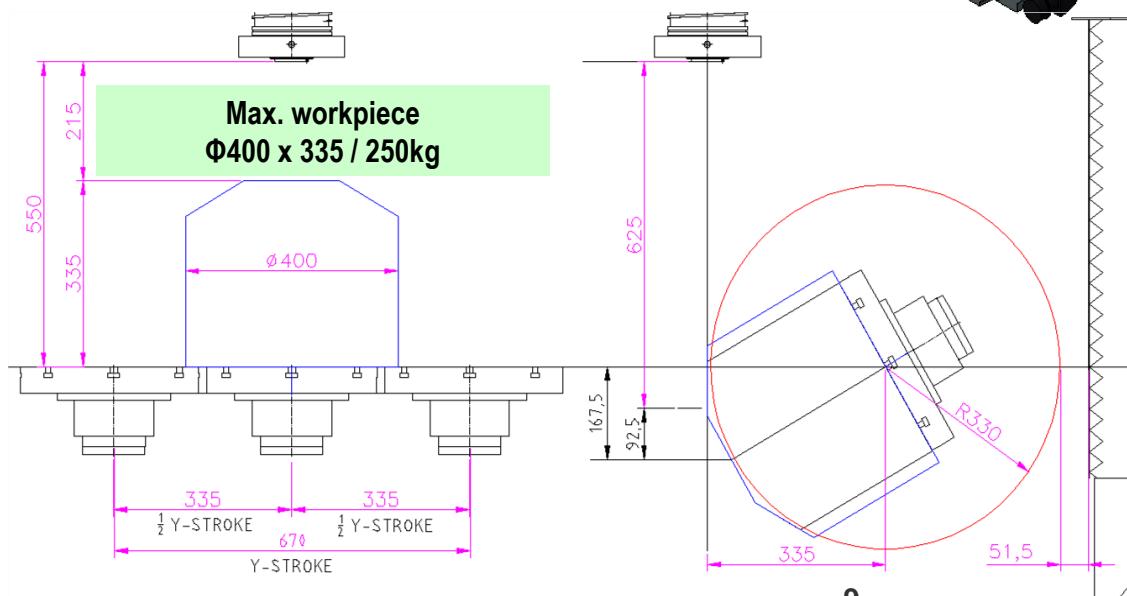
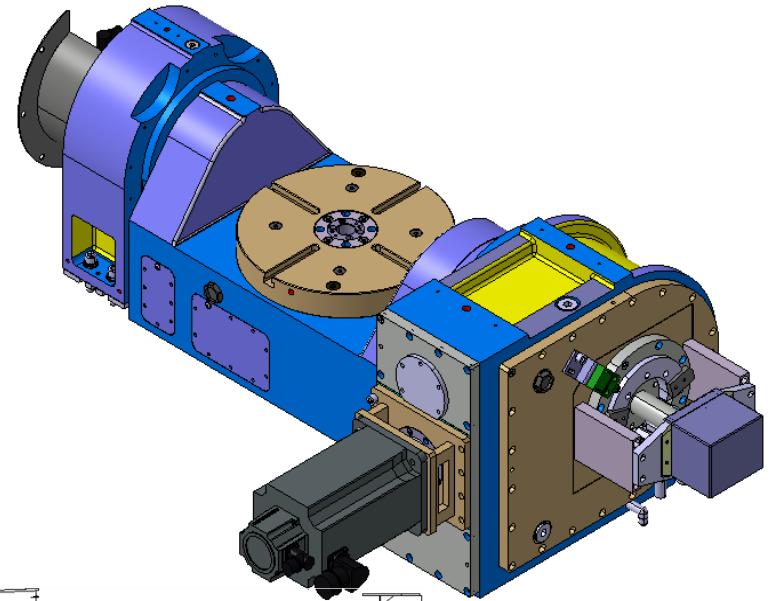
- High Torque
- Self locking structure

- Rigid C-frame structure with ARCH-shape column

DNM350/5AX – Major units & sales point (2/5)

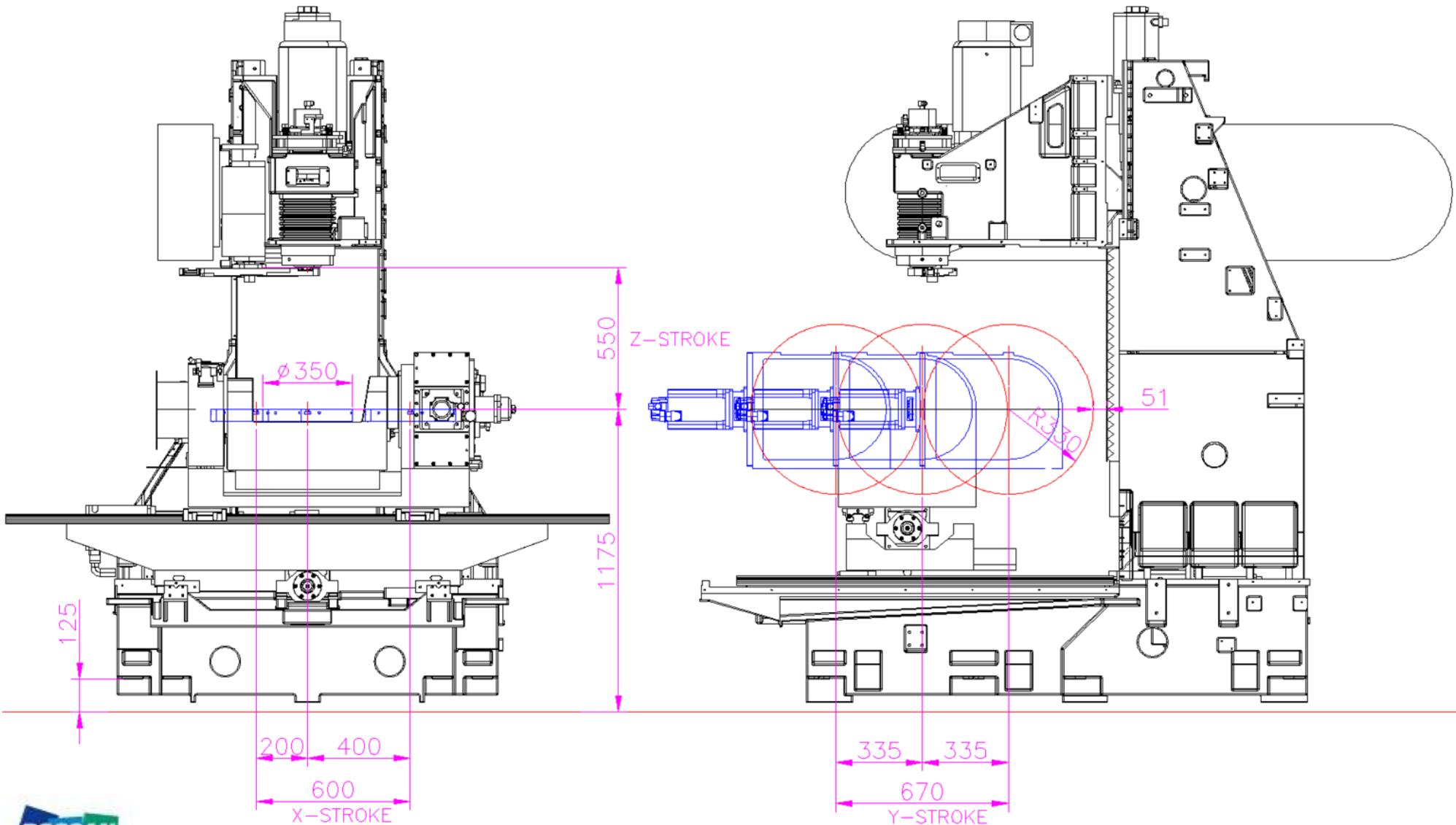
Biggest workpiece in it's class, High Stiffness & High-precision Rotary table : Designed, Made by Doosan

Items		Unit	DNM350/5AX
TABLE	Size (Dia.)	mm	Φ350
	Max. Work size	mm	Φ400x335
	Max. Work weight	kgf	250
TRAVEL	Rotating (C-Axis)	deg	360
	Tilting (A-Axis)		+30~120
RAPID	Rotating (C-Axis)	rpm	30
	Tilting (A-Axis)		20



DNM350/5AX – Major units & sales point (3/5)

Biggest work area in it's class

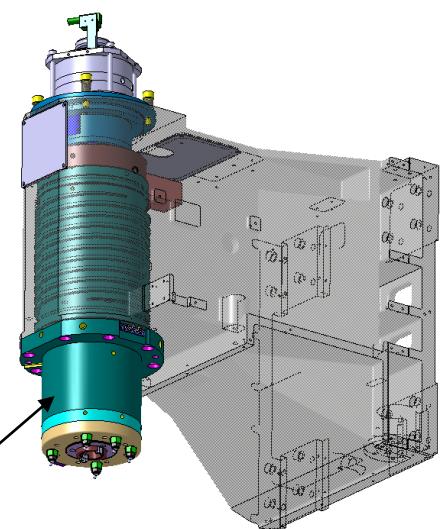
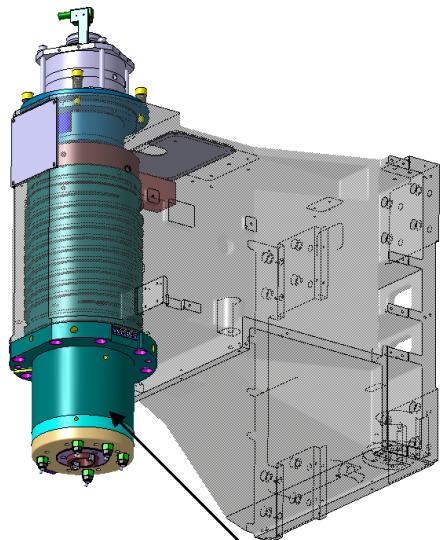
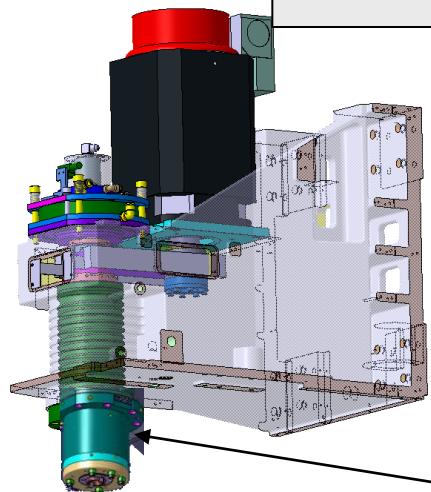


DNM350/5AX – Major units & sales point (4/5)

Various spindle

	Fanuc	Haidenhein
Type	Belt	Built-in
Rpm	12k	12k / 20k
Motor	α12/12000i	αB112S/20000i SMI 170-250-4 (Same VC630) <= DNM-HS Cartridge Modify
Applied for 4+1 Version	Applied for 5-Axis Version	Applied for 5-Axis Version

Belt → direct

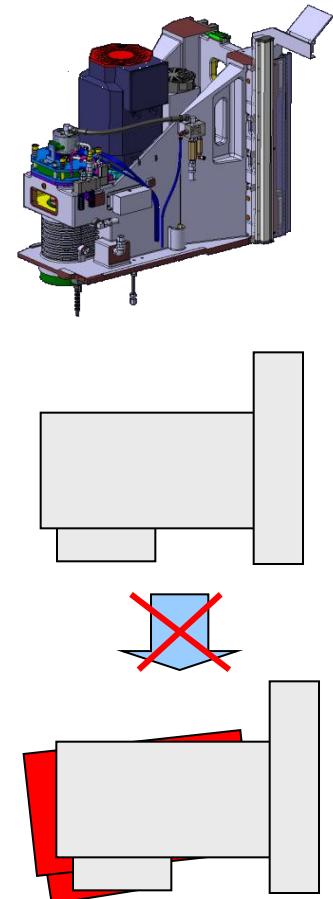
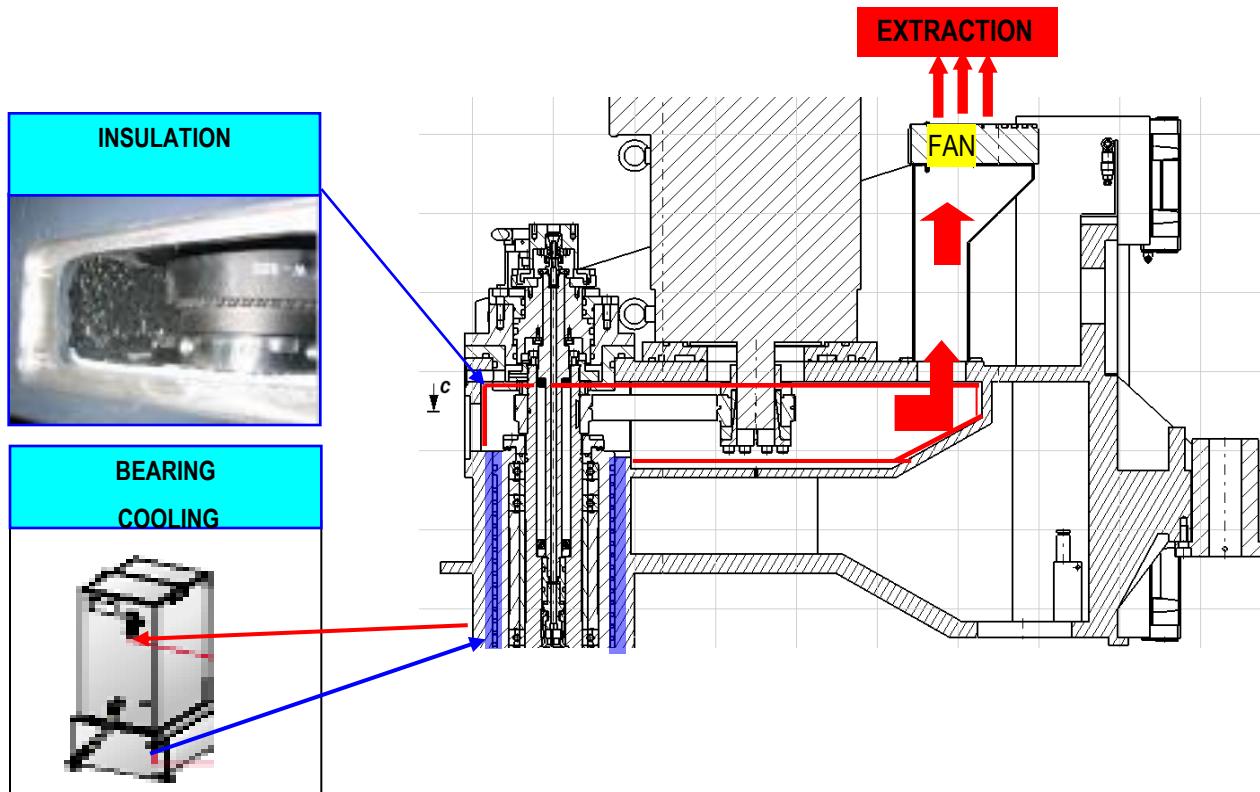


Apply a Long Nose

DNM350/5AX – Major units & sales point (5/5)

Design for minimizing thermal growth

- Heat from Bearing : Chilled by Oil circulation.
- Heat from Belt : Insulates body casting from hot air and ventilates using the fan.



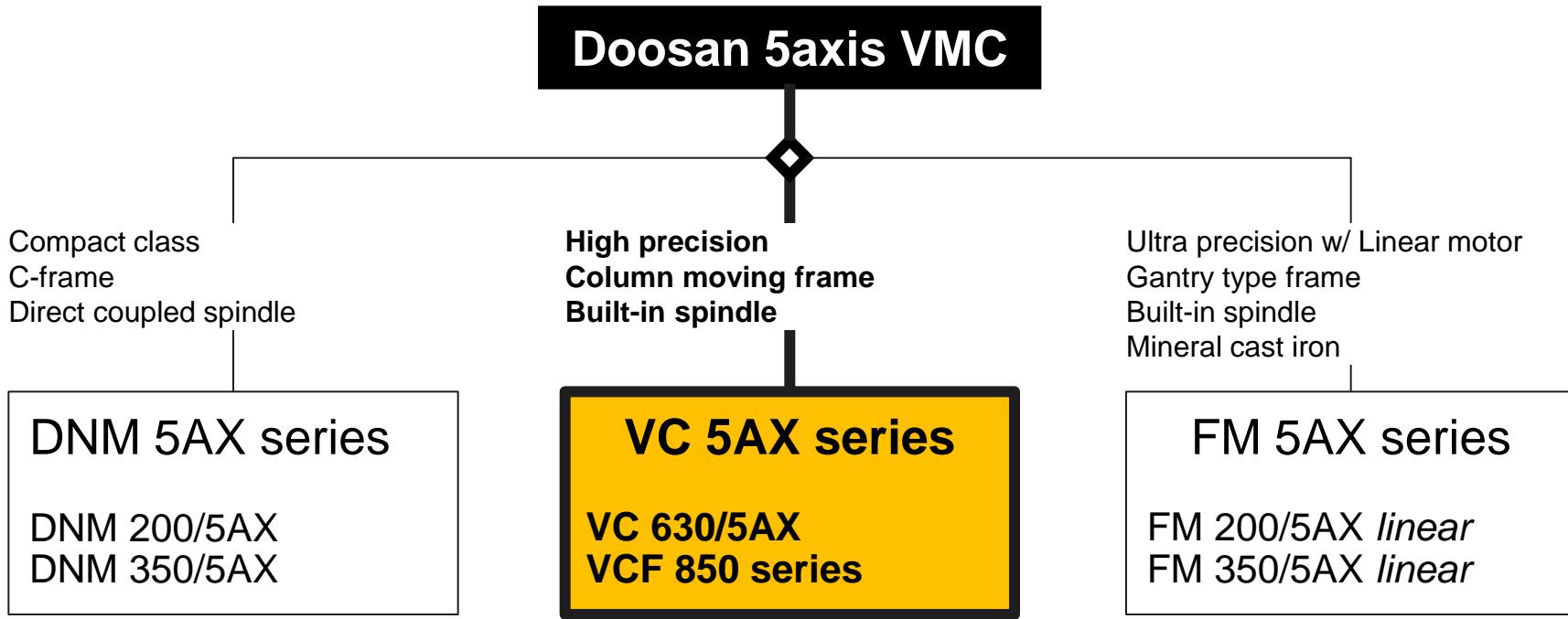
DNM350/5AX – Specification

COMPARISON IN SPECIFICATIONS

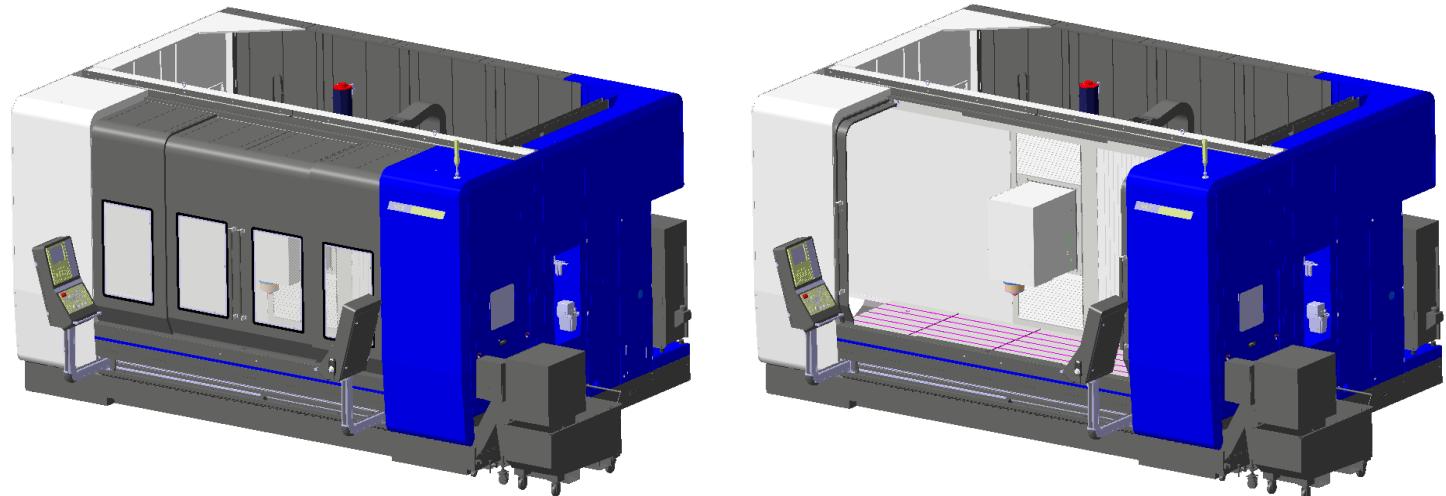
Specification		Unit	Fanuc_4+1	Fanuc_F31iA5	Heidenhain_TNC530
Travel	X/Y/Z axis	mm	400/655/500	400/655/500	400/655/500
	A/C axis	deg	+30~120/360	+30~120/360	+30~120/360
Rapid Traverse	X/Y/Z axis	m/min	36/36/30	36/36/30	36/36/30
	A/C axis	m/min	20/30	20/30	20/30
Table	Max. workpiece(D x H)	mm	Φ400 x 335	Φ400 x 335	Φ400 x 335
	Load Capacity	kgf	250	250	250
Spindle	Power Transmission		Belt	Built-in(aB112L)	built-in
	Spindle Taper		#40 - BT/CAT/DIN 40	#40 - BT/CAT/DIN 40	#40 - BT/CAT/DIN 40
	Max. Spindle Speed	rpm	12k(a12/12k)	12k(20K)	12k(20K)
	Power	kW	11/15	18.5/22	24/32
	Torque	Nm	106	167	119
ATC	Tool Storage	ea	30(40)	30(40)	30(40)
	Max. Tool Size	mm	300	300	300
	Max. Tool Weight	kgf	8	8	8
	T.T.T	sec	1.3	1.3	1.3
Control	Controller		Fanuc OiMD	Fanuc 31iA	Heidenhain iTNC530
	Servo motor (X,Y,Z)		X/Y/Z=a22	X/Y/Z=a22	X/Y/Z=155D/155F/155F(B)
	Servo motor (A,C)		A/C=a12/a8	A/C=a12/a8	A=QSY122B EcoDyn C=QSY130E
	Dispaly screen		10.4"	10.4"	15"

e 5axis VMC

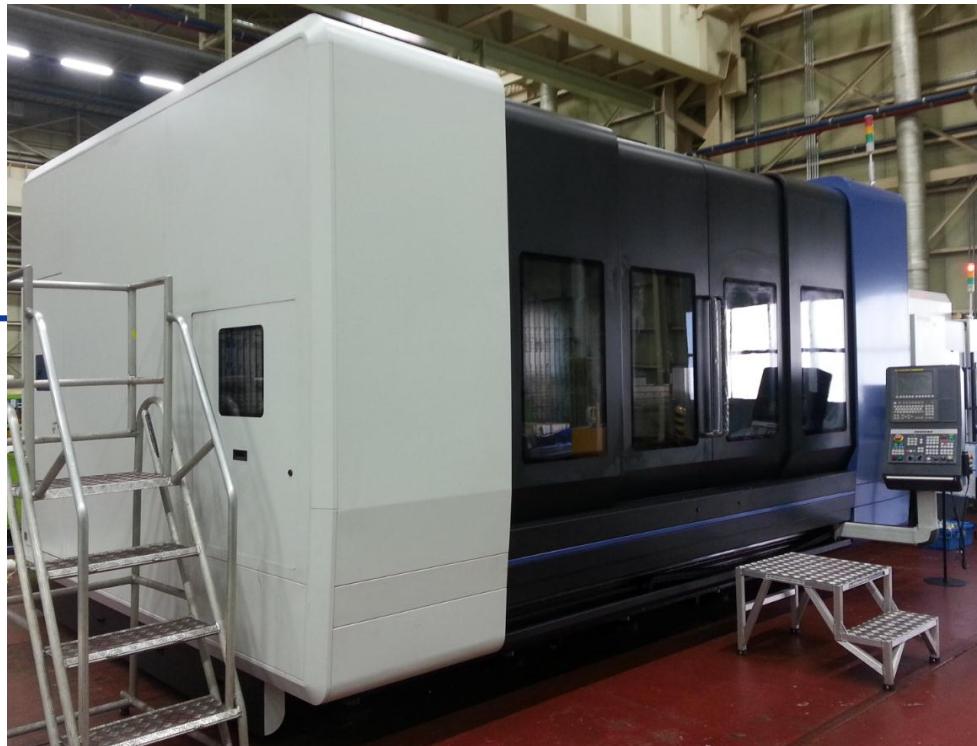
Concept...



* Direct coupled spindle from 2014
mass production plan



VCF850L & 5AX



[Back up] Machine Specifications

Description		Unit	Doosan		MAZAK		DMG	YCM		HEDELIUS
			VCF850L	VCF850L/5AX	VTC800/30	VTC800/30 SR	DMF 260	TCV3000A	TCV3000A-5AF	T8
Capacity	X-axis travel	mm	3,000	←	3,000	←	2,600	3,000	←	3,200
	Y-axis travel	mm	850	←	820	800	1,100	800	←	800+65
	Z-axis travel	mm	800	←	720	←	900	700	800	850
	B-axis travel	deg	-	±110	-	±110	±100	-	±110	-92~+92
	C-axis travel	deg	[360]	←	[360]	360	360	-	360	360
Table	Table size	mm	3,500 X 870	←	3,500 X 820	←	3,200 x 1,100	3,500 X 800	←	3,800 x 800
	Table loading capacity	kg	3,500	←	2,500	←	4,000	3,000	←	3,500
Spindle	Max. spindle speed	min ⁻¹	12k[18k]	12k[18k]	12k	18k	8k[14K,18K]	12k, 150k	←	12k/15k/18k
	Spindle motor	kW	22	←	22	←	24	22	←	26.5/35
Feedrates	Rapid traverse (X,Y,Z)	m/min	40	←	50	←	40	40	←	40/45/45
	Rapid traverse (B)	m/min	-	50	-	50	40	?	33	?
	Rapid traverse (C)	m/min	-	25	25(opt.)	25	16	?	100	?
	Guide way Type	-	Roller LMG	Roller LMG	←	←	←	←	←	←
ATC	Tool storage capacity	tools	30[60]	←	30[48]	←	30[60, 120]	40[80]	←	40[100]
	Max. tool diameter	mm	80	←	80	←	80	76	←	80
	Max. tool diameter without adjacent tools	mm	130	←	130	←	130	125	←	?
	Max. tool length	mm	300	←	350	←	300	300	←	330
	Max. tool weight	kg	8	←	8	←	6	6	←	8
	Tool shank type	-	ISO 40	←	←	←	←	←	←	←
CNC			F0iMD (iTNC530)	iTNC530 (F31iB5)	Mazatrol matrix nexus Mazatrol matrix		iTNC530, S840D	MXP-200 FB(Fanuc base), iTNC530(opt.)		iTNC530, S840D
Machine size	dimensions (length x width x height)	mm	5,390 x 3,930 x 3,131	←	5,250 x 3,573 x 3,152	5,250 x 3,573 x 3,328	6,712 x 4,352 x 3,042	6,990 x 4,352 x 3,400	←	?
	Weight	kg			15,400	16,300	?	2,400	24,700	20,000

[Back up] VCF850L MACHINE CONCEPT/3 Axis (Draft)

BACK UP

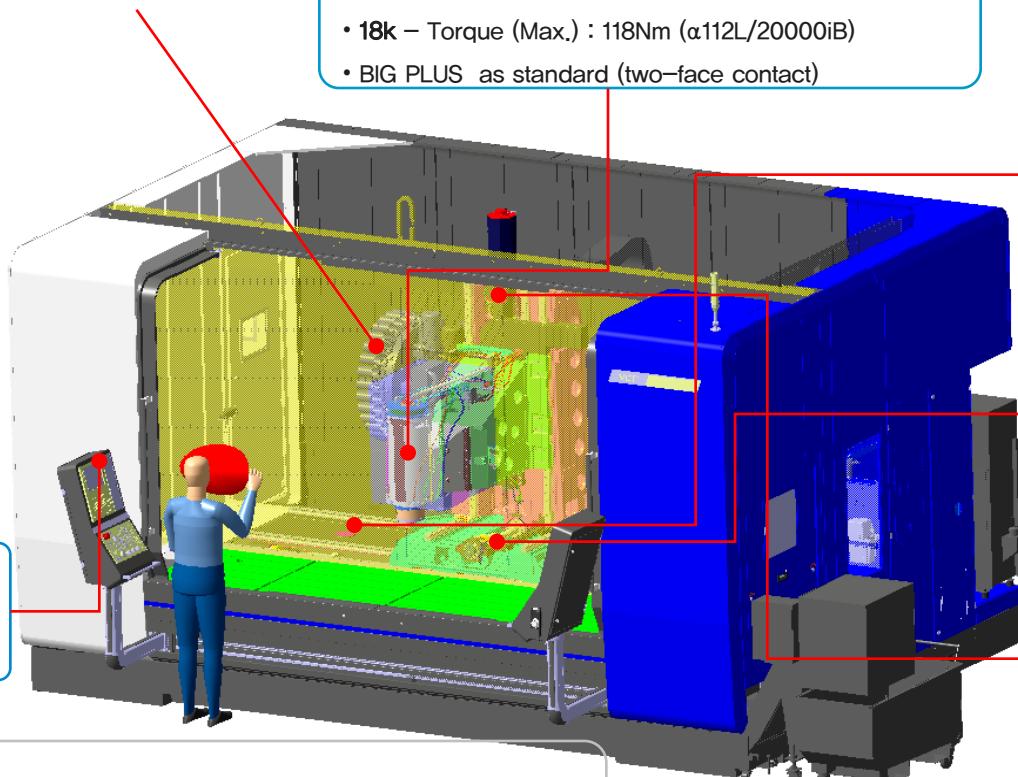
ATC

- Std. 30/Drum Type(DNM Modify)
- Opt. 60/Chain type
- T-T-T Time : 1.5sec

X : 3,000

Y : 850

Z : 800



SPINDLE

- Taper : BT40 (HSK-A63)
- Speed : 12,000rpm (**opt. 18,000rpm**)
- Power (Const/ Short) : 18.5kW / 22kW
- 12k – Torque (Max.) : 204Nm (α 112LL/15000iB)
- 18k – Torque (Max.) : 118Nm (α 112L/20000iB)
- BIG PLUS as standard (two-face contact)

X-AXIS

- Rapid traverse : 40mpm
- Roller type LMG (3 raws)
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

Y-AXIS

- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

Z-AXIS

- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

Access convenience structure

- 180 ° Swiveling Type OP Panel
- Easy operation & vision

Option

- Auto door
- Linear scale feed back system(X, Y, Z axis)
- Through the spindle coolant system
- Oil skimmer
- Oil mist collector
- Tool length & radius Measurement
- Test bar
- Chip conveyor & bucket
- MQL

[Back up] VCF850L MACHINE CONCEPT/5 Axis (Draft)

BACK UP

ATC

- Std. 30/Drum Type(DNM Modify)
- Opt. 60/Chain type
- T-T-T Time : 1.5sec

X : 3,000

Y : 850

Z : 800

Indexing Table(C axis)

- Size / Rapid : $\phi 800\text{mm}$ / 25rpm
- Max. Allowable Load : 1,200kg
- Max. Workpiece
: $\phi 1,050 \times h 900$

Access convenience structure

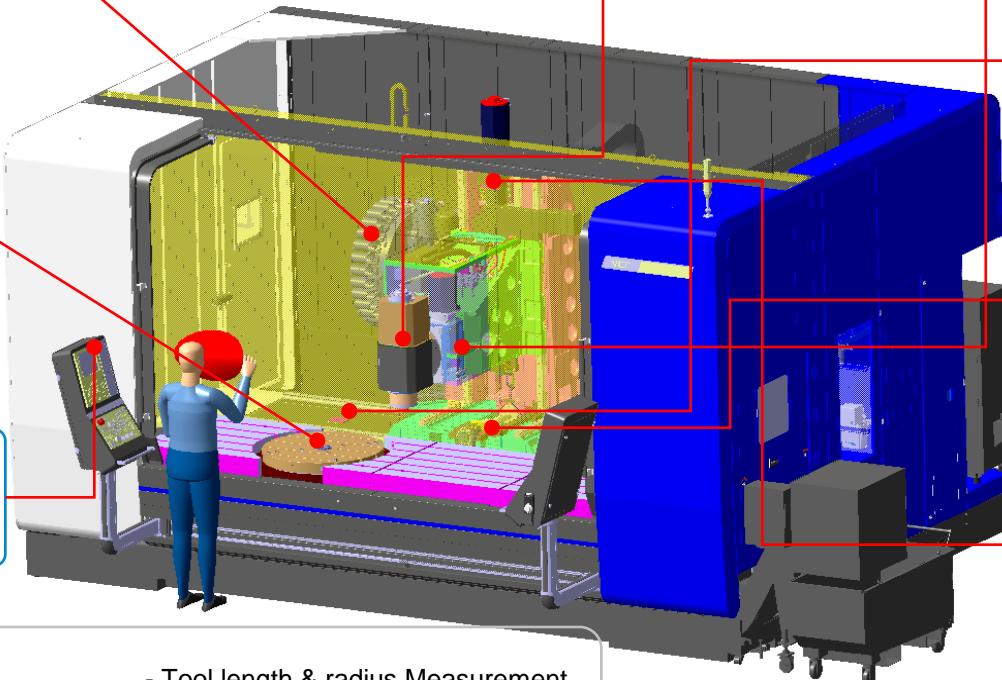
- 180 ° Swiveling Type OP Panel
- Easy operation & vision

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- Auto door
- Linear scale feed back system(X, Y, Z axis)
- Through the spindle coolant system
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SPINDLE

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- Speed : 12,000rpm (**opt. 18,000rpm**)
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- 12k – Torque (Max.) : 204Nm ($\alpha 112\text{LL}/15000\text{iB}$)
- 18k – Torque (Max.) : 118Nm ($\alpha 112\text{L}/20000\text{iB}$)
- BIG PLUS as standard (two-face contact)



- Tool length & radius Measurement
- Test bar
- Chip conveyor & bucket
- MQL

B-AXIS

- Rapid / Stroke : 50rpm / $\pm 110\text{degree}$
- Drive Torque / Hyd. Clamp Torque : 1,000Nm / 2,000Nm(@50bar)

X-AXIS

- Rapid traverse : 40mpm
- Roller type LMG (3 raws)
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

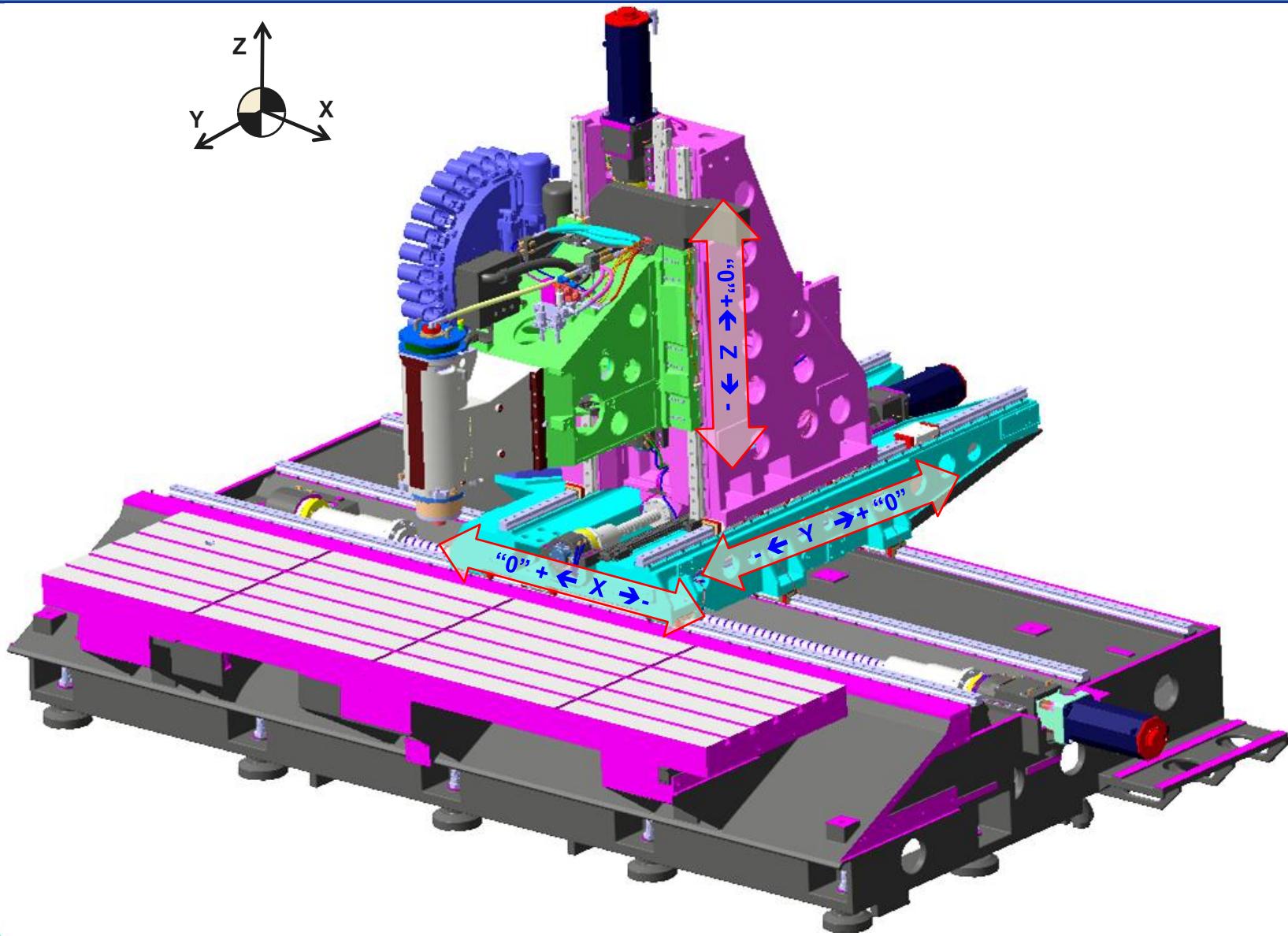
Y-AXIS

- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

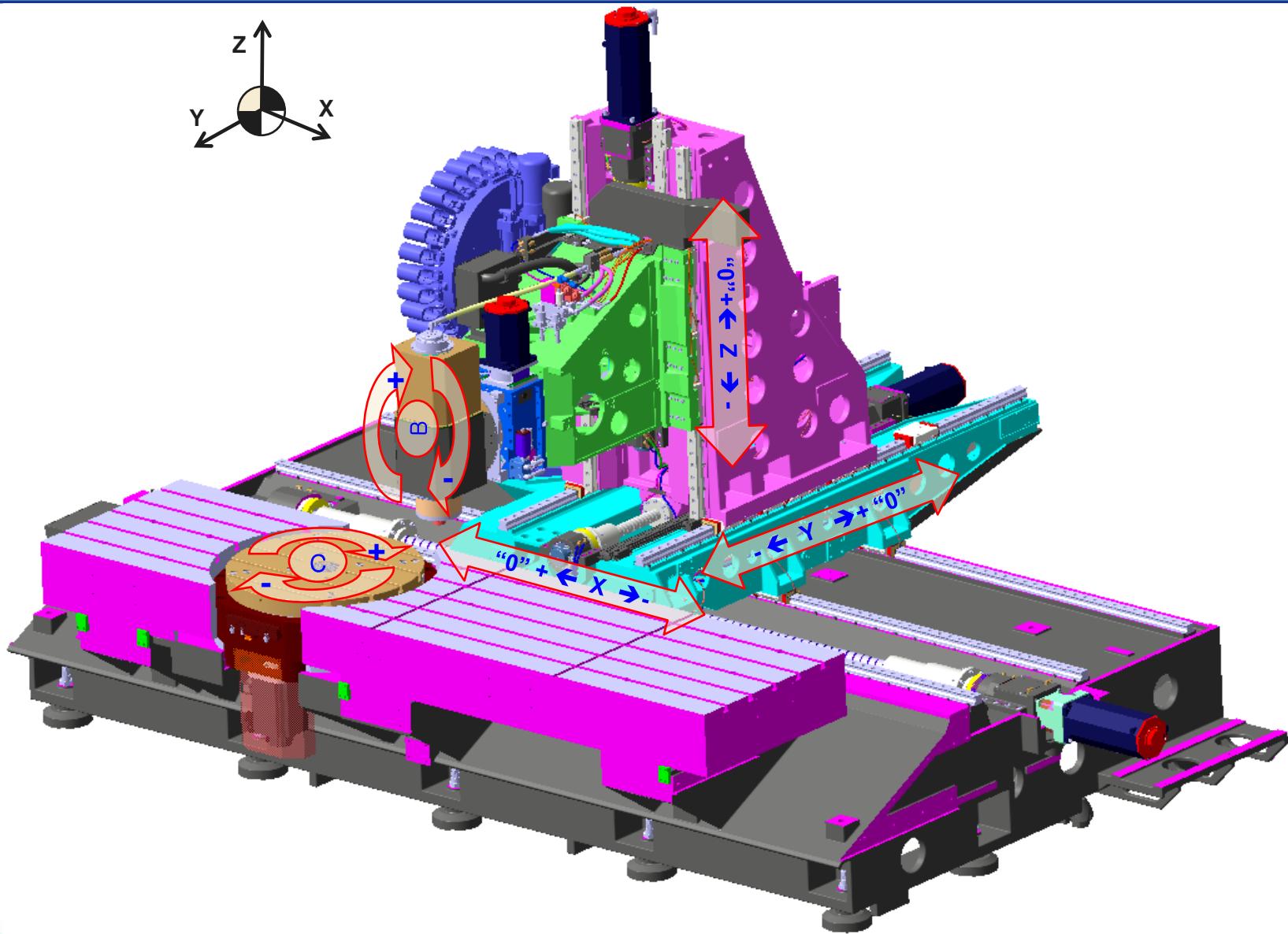
Z-AXIS

- Rapid traverse : 40mpm
- Roller type LMG
- Ball screw nut cooling & support bearing cooling (std.)
- Linear scale (Option)

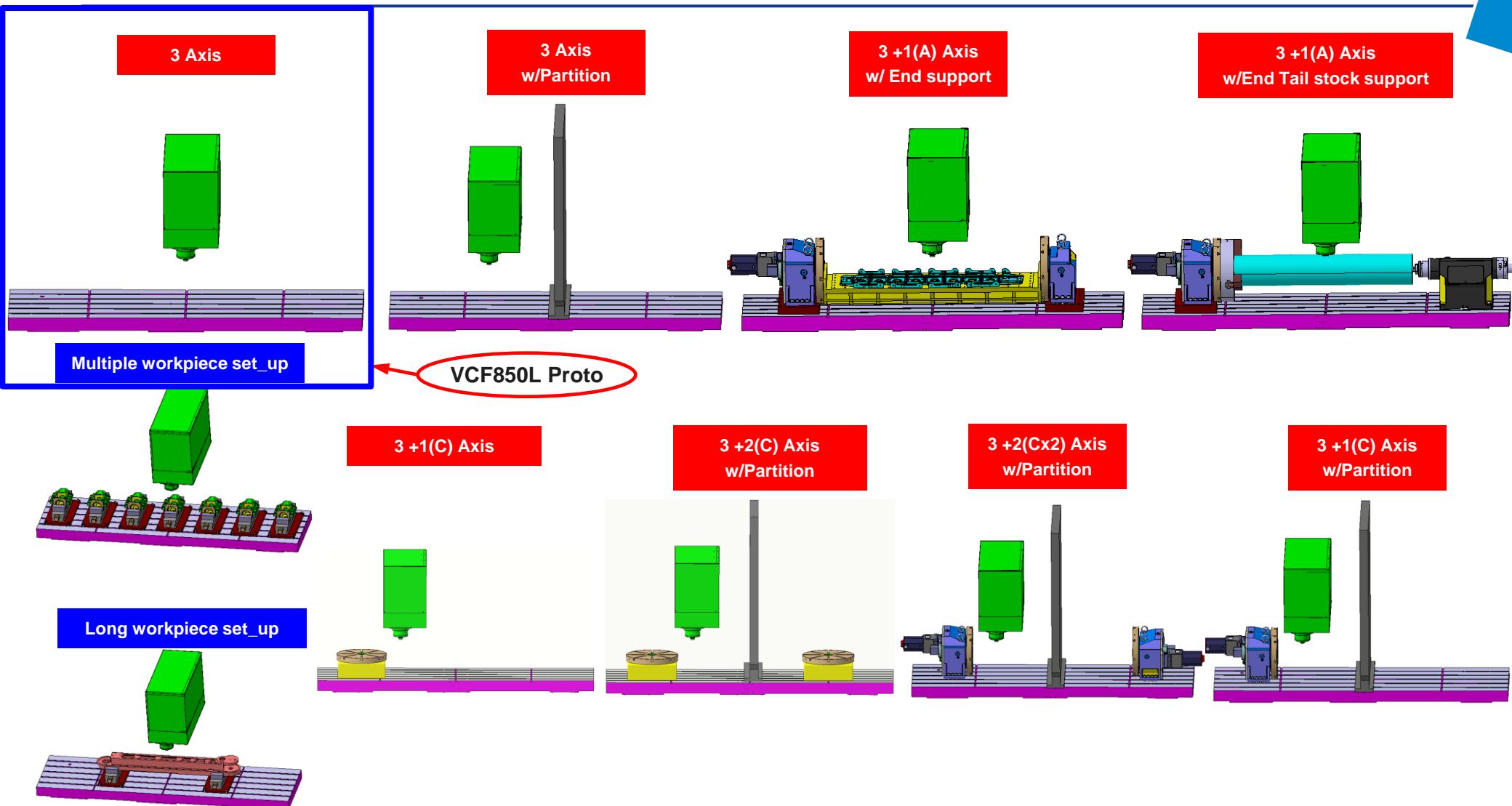
[Back up] Structure (3 Axis)



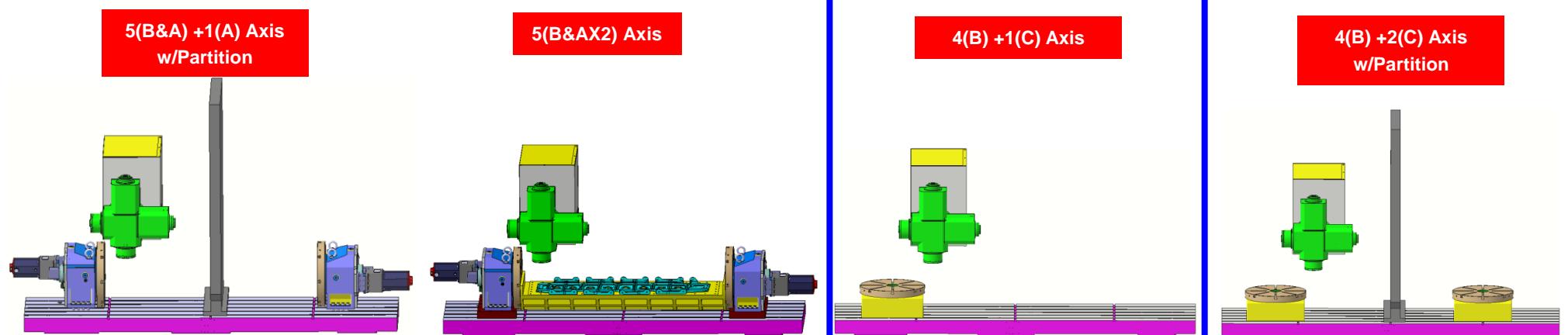
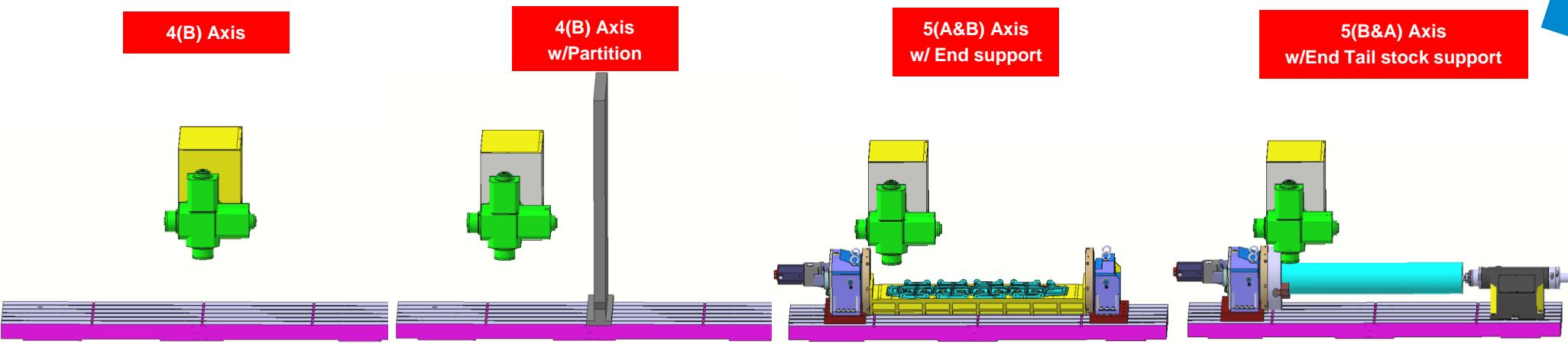
[Back up] Structure (5 Axis)



[Back up] VCF850L Machine application(3 Axis)



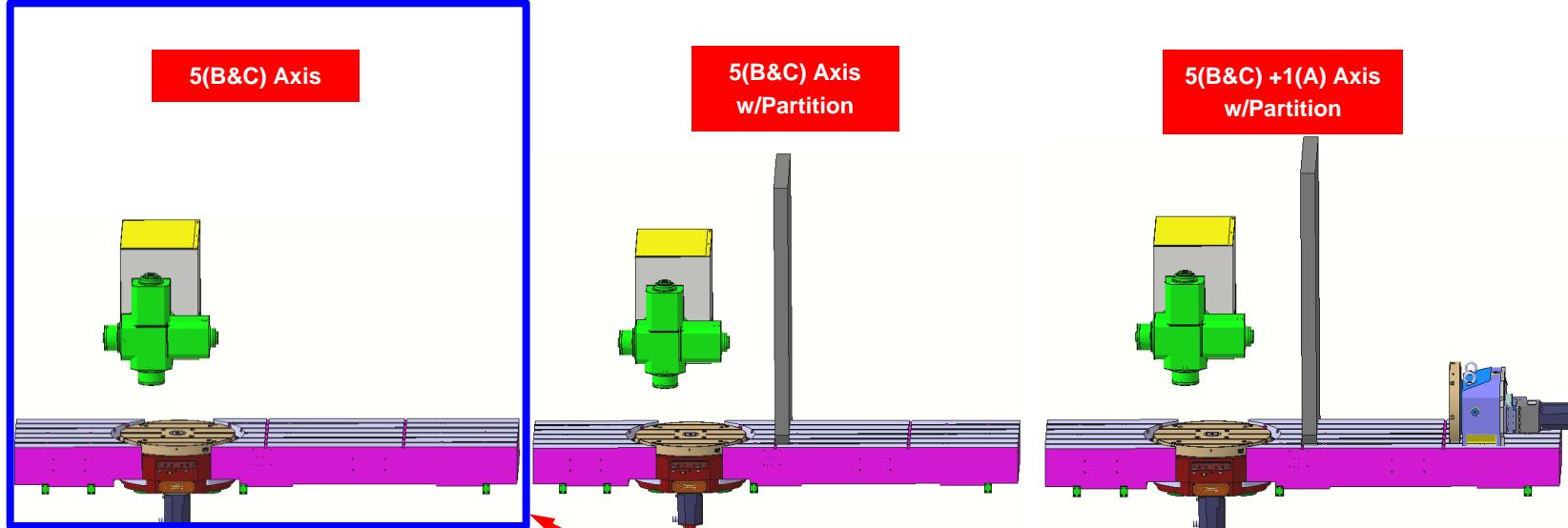
[Back up] VCF850L Machine application(w/Tilting head)



Indexing Table(C axis)

- Size / Rapid : **Φ500mm** / 20rpm
- Max. Allowable Load : 1,200kg
- Max. Workpiece : **Φ730 x h 600**
- Made in Doosan

[Back up] VCF850L/5ax Machine application(w/Tilting head & Built in table)



Indexing Table(C axis)

- Size / Rapid : **Φ800mm** / 25rpm
- Max. Allowable Load : 1,200kg
- Max. Workpiece
: $\Phi 1,050 \times h 900$
- Made in Doosan

VCF850L/5AX Proto(exhibit at '14.4 simtos)

Mazak VTC series (1/4)

Job-shop 고객의 다양한 수요산업의 중/대형 다품종 가공용

Absolute Flexibilität für die vertikale Bearbeitung mit der Serie VTC

VTC-800 SR



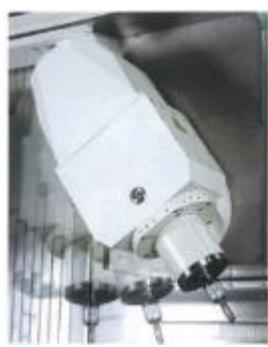
VTC-560/820



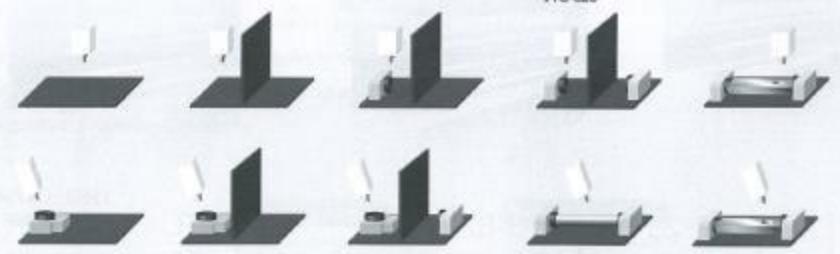
Konfiguration
je nach Modell

Mazak VTC series (2/4)

Column moving for X/Y axis, Partition for twin table, 별치형 NC Rotary table for 5axis(Hor./Ver.), Mazatrol



Absolute Flexibilität für die vertikale Bearbeitung
Beispiele für verschiedene Maschinenkonfigurationen:



Schwenkkopf (B-Achse)

Schwenkkopf



VTC-800SR

Fester Kopf



VTC-560
VTC-620

Mazak VTC series (3/4)



Standard Machine Specifications

VTC-800/30SR		
Travel	X axis	mm 3000
	Y axis	mm 800
	Z axis	mm 720
	B axis	Deg. $\pm 110^\circ$
	C axis (option)	Deg. 360
Table	Size	mm 3500x820
	Load capacity	kg 2500
Spindle	Spindle taper	ISO 40
	Max. speed	min ⁻¹ 18000
	Power (50% ED)	kW 35
	Torque	Nm 166
Feed rate	Rapid traverse (X, Y, Z axis)	m/min 50
Magazine	Number of tools	30
	Max. diameter of tool	mm 80 (130*)
	Max. length	mm 350
	Max. weight	kg 8 * adjacent tool pockets empty

200C

テーブルサイズ 移動量 (X/Y/Z/B/C) ¹	2300×510 mm 1950/510/510/-/- mm
单送り速度 (X/Y/Z)	30000 mm/min
主軸回転速度 (50%ED)	10000 min ¹ (rpm), 15 kW (20 HP) (10%ED)
ツールシャンク	MAS BT-40
工具収納本数	24,30
所要床面の大きさ	2925×3950 mm

800/30SR

テーブルサイズ 移動量 (X/Y/Z/B/C) ¹	3500×820 mm 3000/800/720 mm/ $\pm 110^\circ$ /360°
单送り速度 (X/Y/Z)	50000 mm/min
主軸回転速度 (50%ED)	18000 min ¹ (rpm), 35 kW (25 HP) (50%ED)
ツールシャンク	MAS BT-40, CAT-40
工具収納本数	30,48
所要床面の大きさ	5250×3550 mm

* 'オプション' C軸(円テーブル含む)はオプションで

2013년 최신
마작 전체 카탈로그

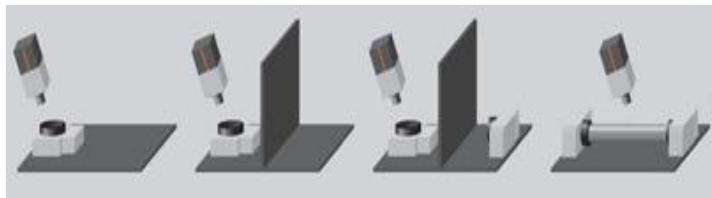
Standard Equipment	Optional Equipment
Full coverage chip and coolant guard	C-axis rotary table
Tool length measurement unit	Kitacawa MR320 rotary table
Flood and through spindle coolant (5 bar)	Centre partition
Spindle chiller unit	Table riser (130 mm)
Work light	48 tool magazine
Preparation for chip conveyor	Chip conveyor (hinge type)
Machine manuals	High pressure coolant system (15 bar)
Foundation kit	Mayfran Consep2000 II chip removal/coolant cleaning system (15 bar)
	Mayfran Consep2000 II chip removal/coolant cleaning system (70 bar)

Vertical machining center for 5-axis simultaneous machining

VTC-800/30 SR provides multiple-face milling and 5-axis simultaneous machining thanks to the 110 degree swinging 18000 rpm spindle and optional NC table. The traveling column design with stationary table is extremely effective for large, long workpieces.

Optional NC table
→ 별치형 R/table 표기

Mazak VTC series (4/4)



The 6th generation conversational CNC control from MAZAK. MAZATROL, the first conversationally programmed CNC system in the world, was introduced in 1981. In 1998, the MAZATROL was fused with a personal computer that incorporated our extensive expertise for unsurpassed operating efficiency... The newest model, the MAZATROL MATRIX, has been designed to be the optimum system for machine tools, offering a range of Intelligent Functions for increased productivity and ease of operation.



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Swivel head(B축)

2 The swivel head offers a (+/-) 110 degree tilt axis and is equipped with the latest roller gear cam technology. This technology is also used on Mazak's Integrex range of multi-tasking machine tools, a feature that delivers improved accuracy and repeatability due to its backlash-free design.

A significant reduction of machining processes and increased productivity can be realized thanks to the additional axis, and when combined with a rotary table, full five-axis simultaneous machining is possible.

CNC CONTROLLERS

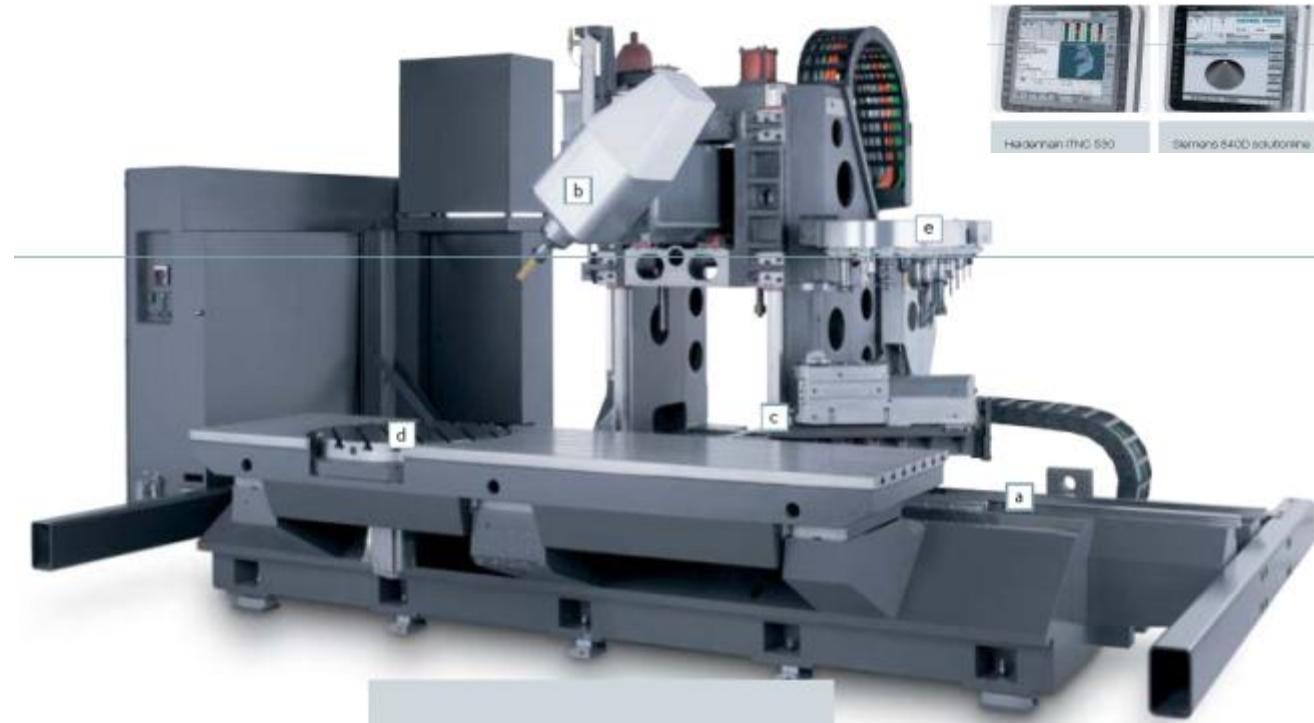
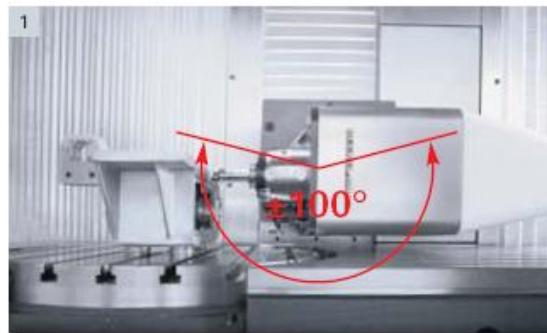
MATRIX	MATRIX NEXUS
<ul style="list-style-type: none">▶ Controlled Axes: 5▶ Mazatrol & EIA/ISO func.▶ 4000 registered tools▶ 15" Display▶ Product Page	<ul style="list-style-type: none">▶ Controlled Axes: 3▶ Mazatrol & EIA/ISO func.▶ 4000 registered tools▶ 12" Display▶ Product Page

SMART	FUSION 640
<ul style="list-style-type: none">▶ Controlled Axes: 4▶ SMART functions▶ EIA/ISO Comparability▶ 12" Display▶ Product Page	<ul style="list-style-type: none">▶ Controlled Axes: 3▶ Mazatrol & EIA/ISO func.▶ 960 registered tools▶ 10.4" Display▶ Product Page

DMG

DMF series (1/2)

Column moving for X axis, RAM Spindle head, Linear motor(옵션), Partition for twin table,
Integrated NC Rotary table for 5axis, milling & turning, iTNC530/S840D



23/03/2012

Transport zone: ohne Zone / no zone defined

No. of axes:

4 controlled main axes (spindle, X,Y;Z-axis)

optional:

B-Axis (Swivel head)

C-axis (nc-subtable)

Swivel head(B축)

NC-subtable(C축)

A-axis (nc-subtable, nc-divider)

3, 4 or 5 - axis interpolation according to specification

2 axis circular-interpolating, helix interpolation

NC-subtable
(별치형, C축)

S-G3212

NC sub-table d 700 mm / d 27.3 in as C-axis mounted on the rigid table with absolute direct measuring system.

Installation in the left working area

No through bore in the center of the table is available.

Partition wall
(center partition)

S-G3205

Removable **partition wall** (possible with integrated round table)

The working area can be divided by a removable partition wall. For security on Travelling column is a stop switched in by pneumatic support.

VC 5AXIS series

Rotary table dia. (mm)	Tool taper	Function		
		Non simultaneous 5AX((4+1axis))	Simultaneous 5AX	
		F0iMD	F31i5	iTNC530
350	#40		DNM 350/5AX	
	HSK E40			FM 350/5AX <i>linear</i>
500	#40		NX 500/5AX	
630	#40		VC 630/5AX	

Size ↓

VC630/5AX – OVER VIEW



Heavy Duty 5-Axis VMC

- Simultaneous 5-axis Vertical Machining Center



MAJOR SPECIFICATION

- Stroke [X/Y/Z] : [650/765/520 mm]
- Stroke [A/C] : [+30° ~ -120° / 360°]
- Spindle : 12,000 rpm, 18.5/22kW, BT40
- Table size : Φ630 mm (2-500 x 500mm)
- Max. Workpiece : Φ730x500 mm (Φ730x450 mm)
- Allowable load : 500kgf
- Rapid traverse[X/Y/Z],[A/C] : [40/40/36 m/min],
[20/30 rpm]
- Tool change time : 1.5 sec [T-T-T]
- Tool storage capacity : 40 (60/81/101/121)EA



APPLICATION

- AUTOMOTIVE COMPONENT
- AEROSPACE
- ENERGY



TYPICAL WORKPIECE

- IMPELLER
- ENGINE BLOCK



OPTIONAL FEATURES

- BT / HSK, 12,000 / 20,000 / 30,000 rpm SPINDLE
- ATC : 40 (60/81/101/**121**)EA
- **APC : 2-PALLETS**



COMPETITOR

- MORI, MAZAK, DMG

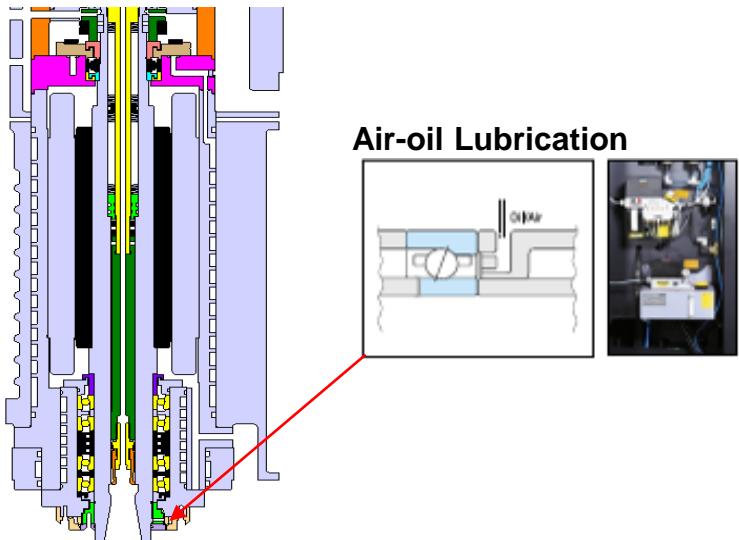


STATUS / SCHEDULE

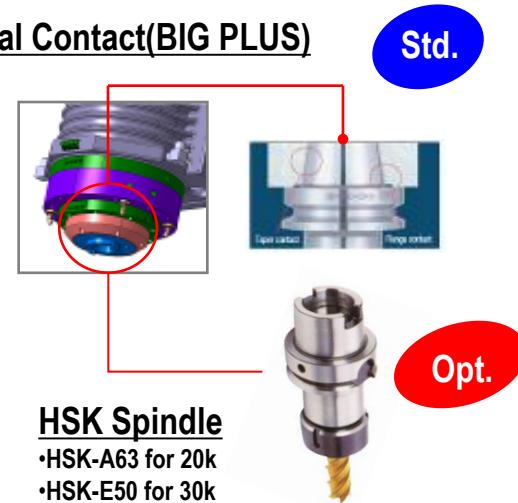
- Under Mass Production

VC630/5AX – Optional Spindle (20,000min⁻¹)

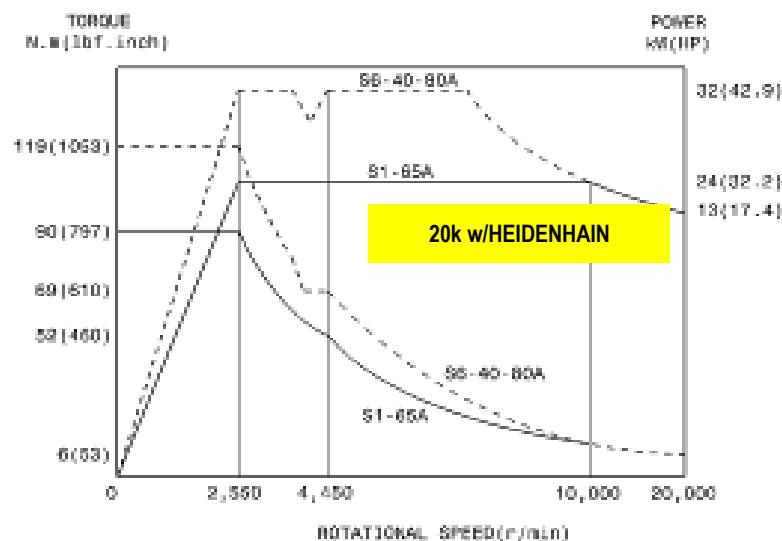
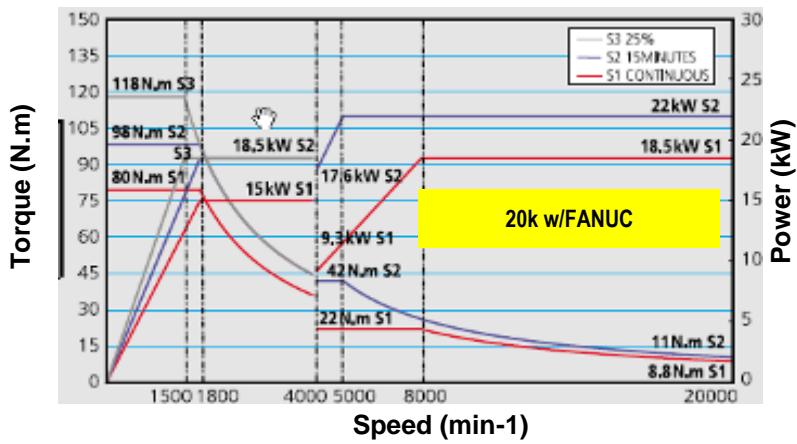
1) Built-in motor driven spindle



Dual Contact(BIG PLUS)



2) Spindle power-torque diagram



VC630/5AX – Optional Spindle (30,000min⁻¹)

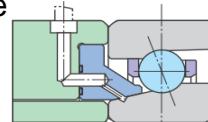
High-speed built-in motor spindle with constant preload mechanism

High-speed Built-in motor

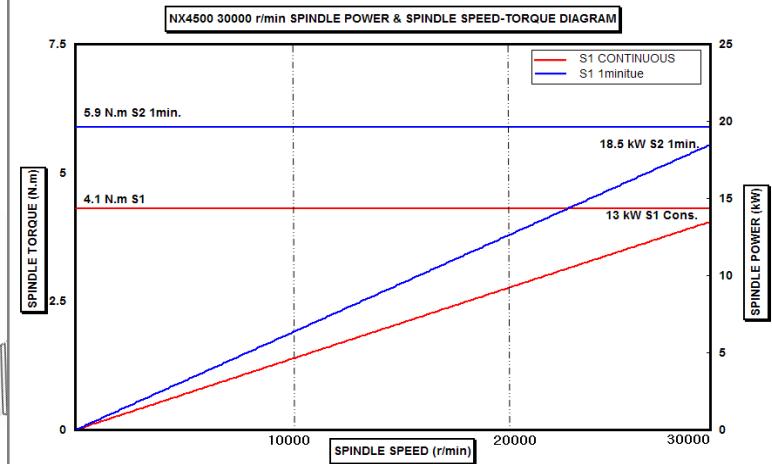
- Adopt High-speed, High-power, Low vibration and Low noise built-in motor
 - 30,000 r/min
 - 13/18.5 kW (const./1min.)

Adopt eco-friendly oil air

- Minimized power loss due to lubricant resistance
- Noise reduction



Motor torque / power diagram



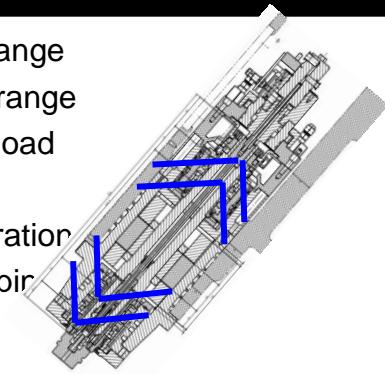
Dual face contact HSK-F63 tooling system

- Improve rigidity from dual face contact (spindle nose and taper)
- Improve tool life and surface roughness through reduction of vibration



Constant preloaded bearing / High stiffness / Low vibration/ Low noise spindle design

- Get longer life in high speed range and high rigidity in low speed range through adoption of fixed pre-load structure.
- Realize low noise and low vibration spindle through reduction of spiral length.



VC630/5AX - Specification

	Features	HEIDENHAIN	FANUC
Travel	X-axis (longitudinal movement of table)	mm (inch)	650 (25.6)
	Y-axis (cross movement of saddle)	mm (inch)	765 (30.1)
	Z-axis (vertical movement of spindle head)	mm (inch)	520 (20.5)
	A-axis (table tilting)	deg.	150 [+30 ~ -120]
	C-axis (table rotation)	deg.	360
	Distance from spindle nose to table top	mm (inch)	210 ~ 730 (8.3 ~ 28.7)
	Distance from spindle center to column guideway	mm (inch)	220 (8.7)
Table	Table size	mm (inch)	Ø 630 (Ø 24.8) {500 x 500}
	Table loading capacity	kg (lb)	500 (1102.3)
	Max. workpiece swing diameter x height	mm (inch)	Ø 730 x 500 (Ø 28.7 x 19.7) {Φ 730 x 450}
	Minimum table indexing angle		0.001
Spindle	Max. spindle speed	r/min	12000
	Spindle taper		ISO#40 7/24 Taper
	Max. spindle torque	N·m (ft-lbs)	119 (87.8) 204 (150.6) [25% ED]
Feedrate	Rapid traverse rate (X/Y/Z)	m/min (fpm)	40 / 40 / 36 (1574.8 / 1574.8 / 1417.3)
	Rapid traverse rate (A/C)	deg/min	20 / 30
	Cutting feedrate (X/Y/Z)	mm/min (fpm)	20000 (787.4)
	Cutting feedrate (A/C)	deg/min	7200
Automatic tool changer	Type of tool shank		MAS403 BT40
	Tool storage capacity		CAM 40
	Max. tool diameter	mm (inch)	Ø 80 (Ø 3.2)
	Max. tool diameter without adjacent tools	mm (inch)	Ø 125 (Ø 4.9)
	Max. tool length	mm (inch)	300 (11.8)
	Max. tool weight	kg (lb)	8 (17.6)
	Method of tool selection		Fixed address
	Tool change time (tool-to-tool)	s	1.5
	Tool change time (chip-to-chip)	s	7
Motor	Spindle motor (cont./10min)	kW (Hp)	24 / 32 (32.2 / 42.9) 18.5 / 22 (24.5 / 29.5)
	Feed motor (X/Y/Z/A/C)	kW (Hp)	7.2 / 4.6 / 4.6 / 7.2 / 5.7 (9.7 / 6.2 / 6.2 / 9.7 / 7.6) 7.0 / 4.0 / 4.0 / 5.5 / 4.5 (9.4 / 5.4 / 5.4 / 7.4 / 6.0)
Power source	Electric power supply	kVA	54
	Compressed air supply	MPa (psi)	0.54 (78.3)
Tank capacity	Coolant tank capacity	L (galon)	360 (95.1)
	Lubrication tank capacity	L (galon)	1.32 (0.3)
Machine size	Machine dimension (L x W x H)	mm (inch)	Std. M/C : 4585 x 3200 x 3295 (180.5 x 126.0 x 129.7)
	Machine weight	kg (lb)	10000 (22045.9)

{ }APC Type

Standard Feature

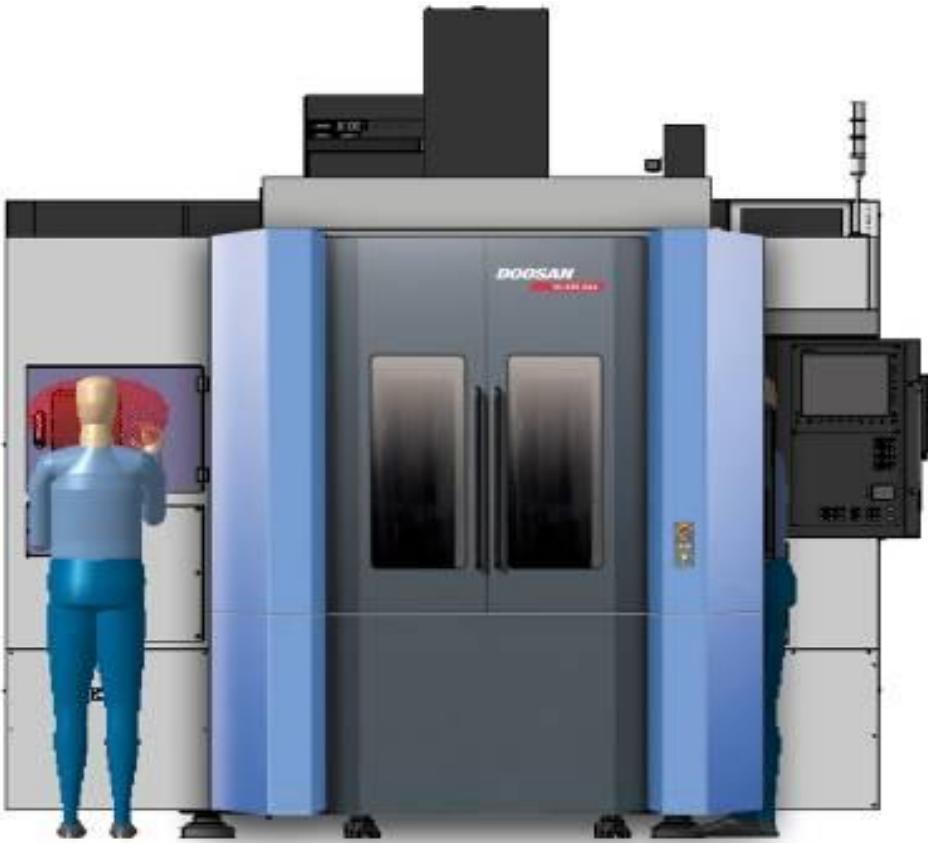
- AI Nano HPCC with RISC
- Assembly & operation tools
- Automatic power off
- Door Interlock for safety
- Full Enclosure splash guard
- Installation parts
- Operator call lamp (yellow, red, green)
- Portable MPG
- Spindle air curtain
- Work light
- Screw conveyor
- Spindle cooling system

Optional Feature

• Air blower	• Air dryer
• Automatic measuring system	
• Automatic tool length measurement with sensor	
• Chip conveyor & chip bucket	
• MQL(minimum quantity lubrication) system	
• Oil Mist collector	• Oil skimmer
• Spindle thermal compensation system	
• Test bar	• Through the spindle coolant system
• Linear scale feed back system (X, Y, Z axis)	

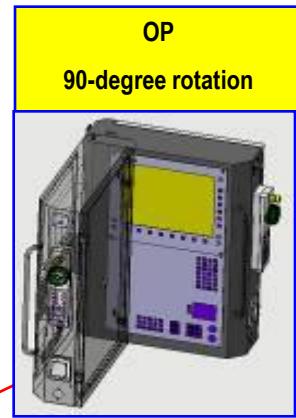
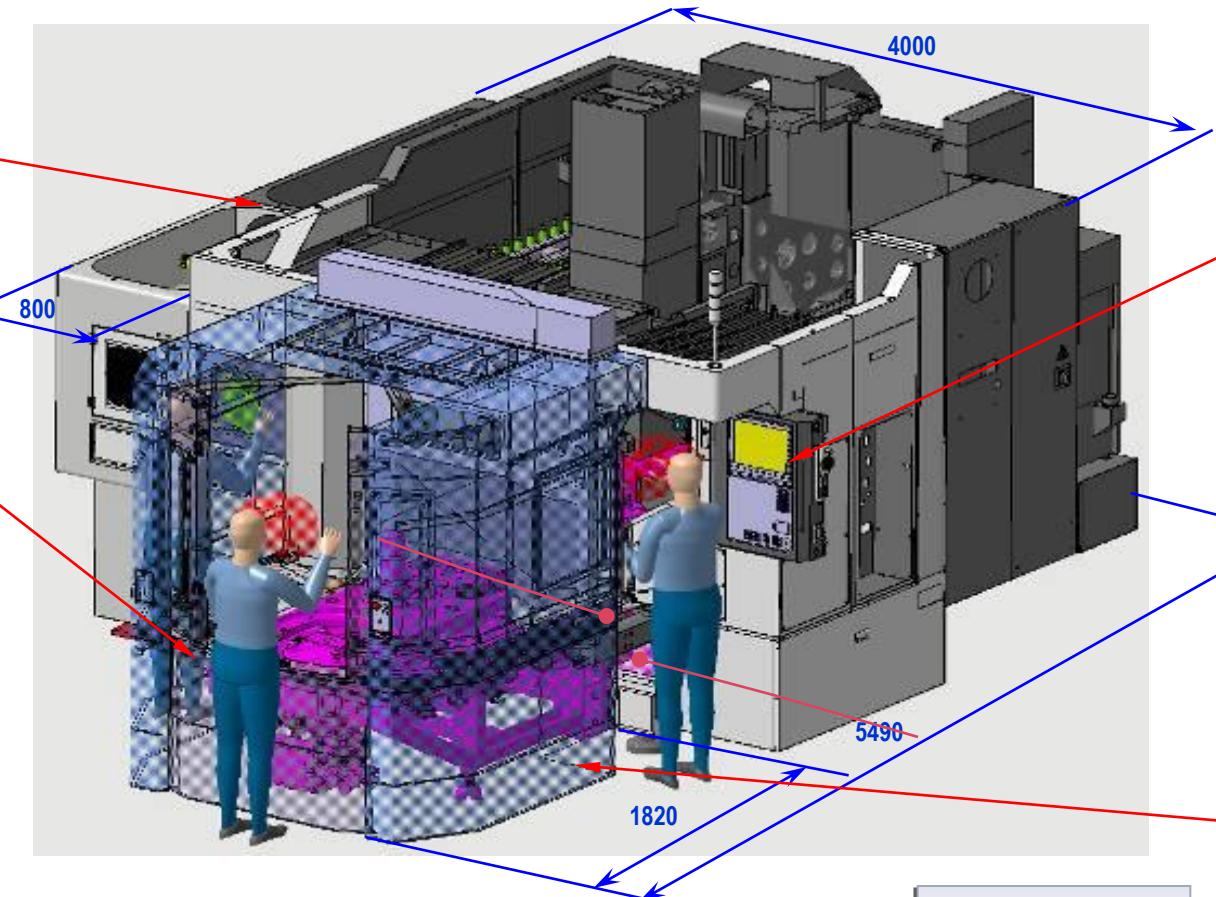
VC630/5AX – APC

APC
Front View

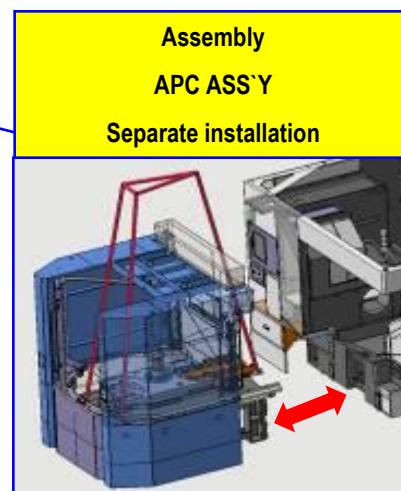


<VC630 5AX W/APC>

VC630/5AX – APC / 121 tools MAG.

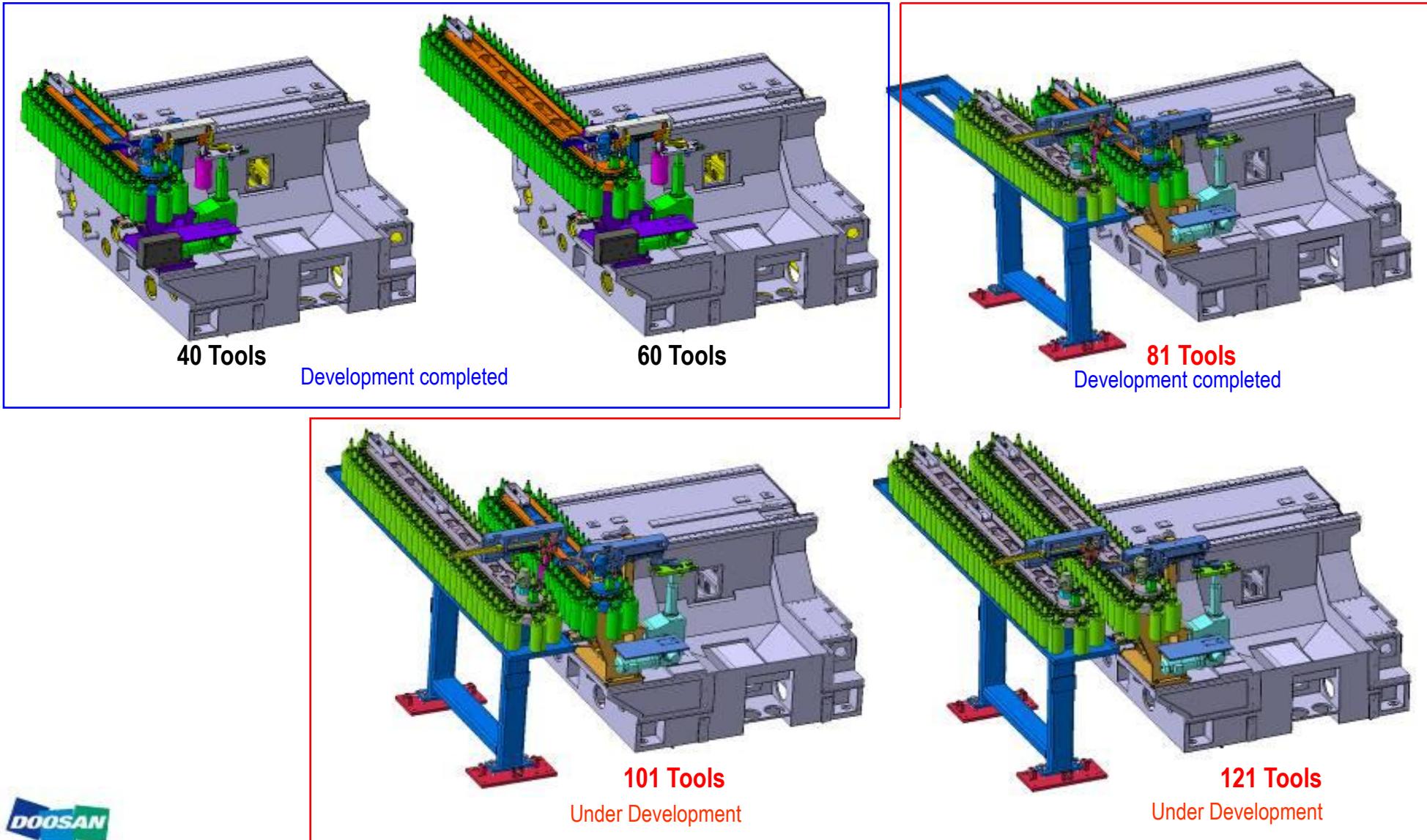


Servo Driven
APC



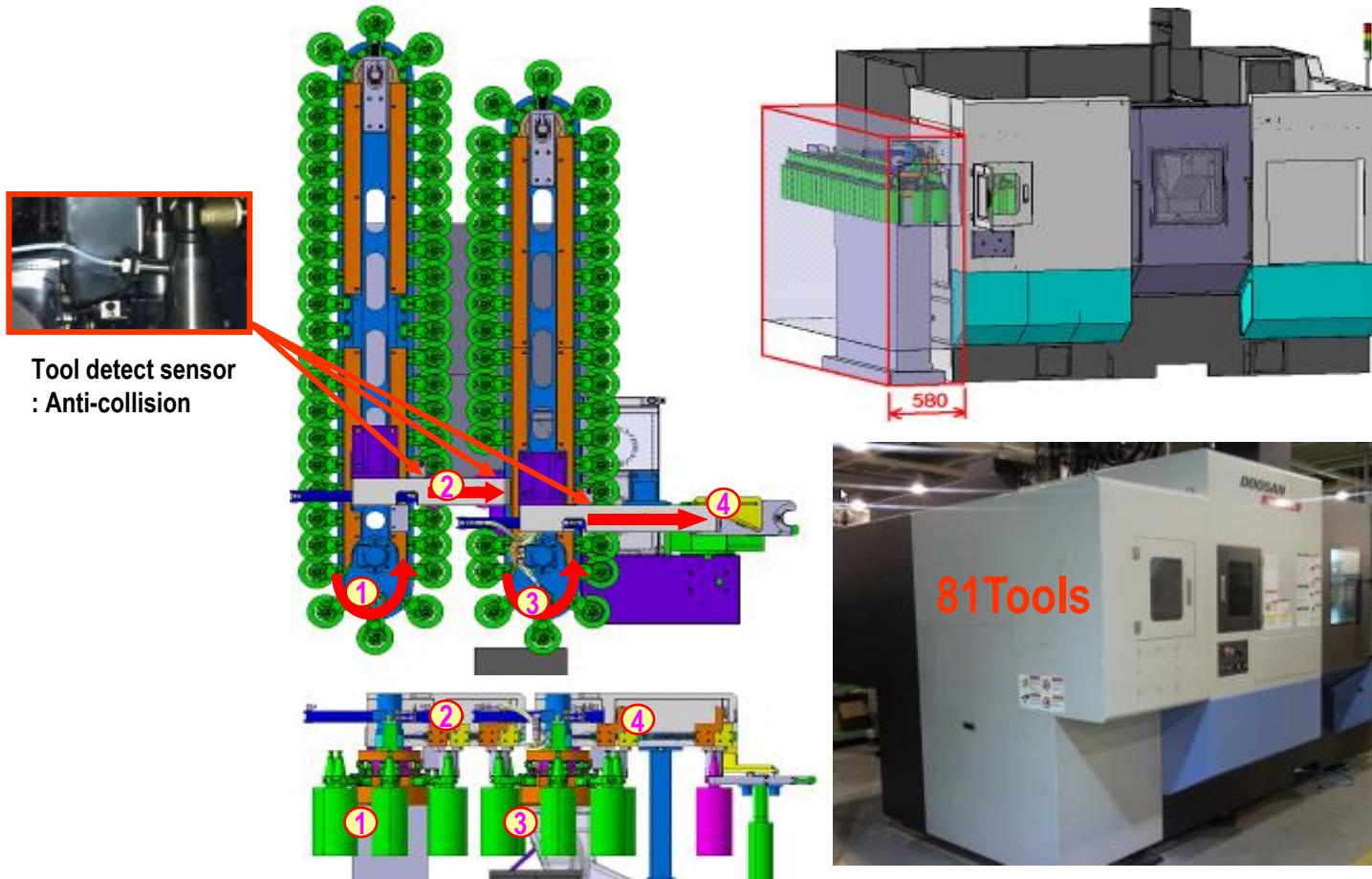
VC630/5AX – Various Tool Magazine

1) Configuration of ATC



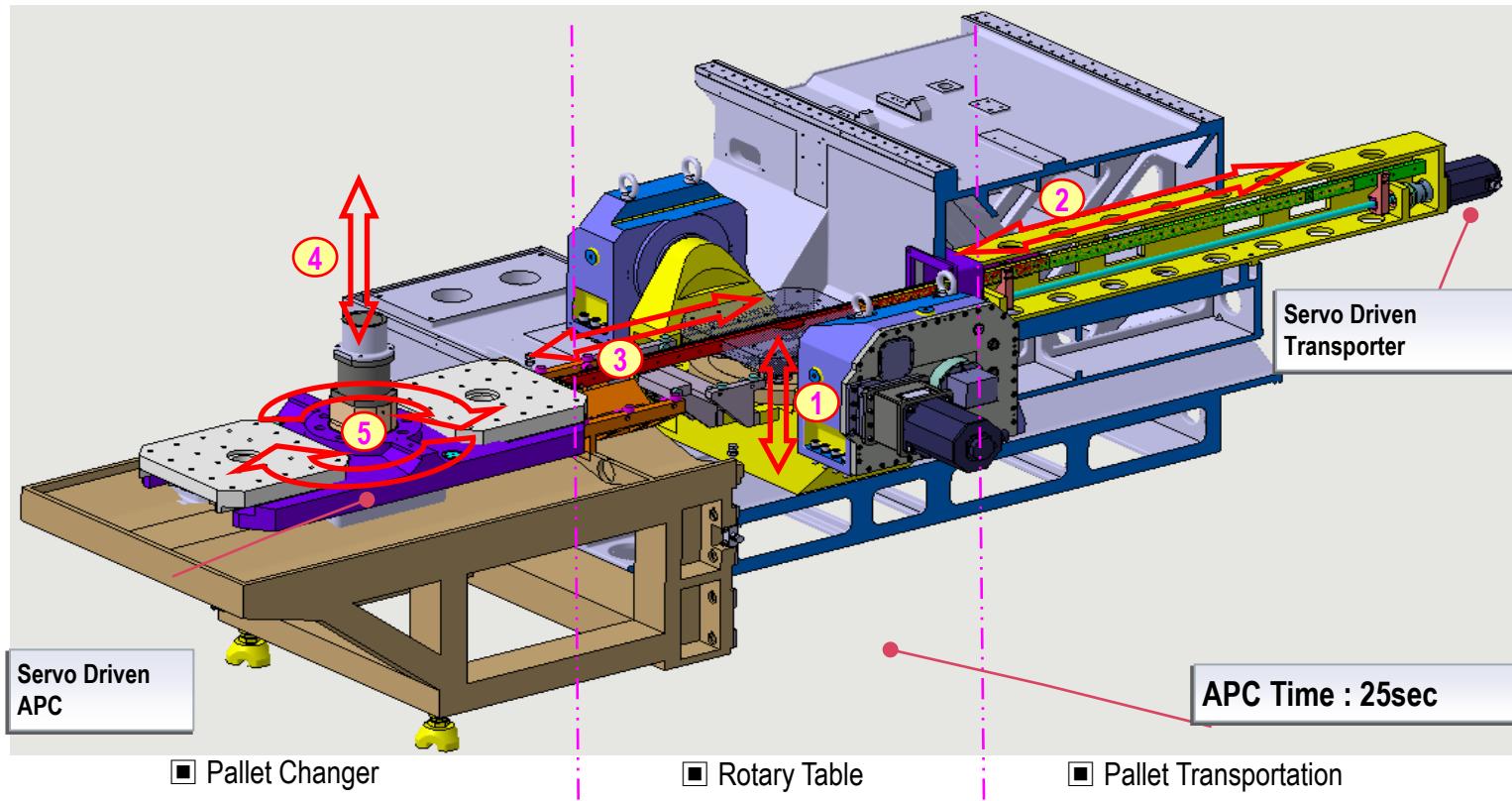
VC630/5AX – Double Magazine

2) 81, 101, 121 Tools Magazine Concept



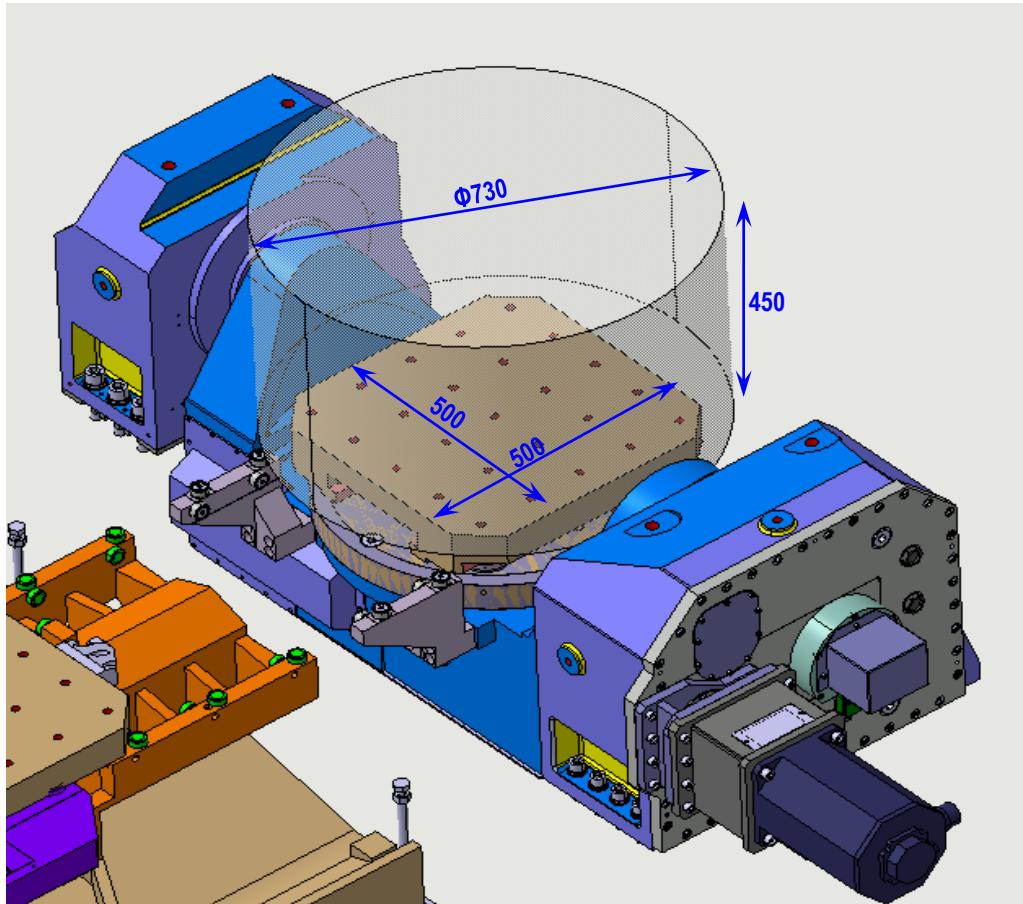
VC630/5AX - APC

1) APC Concept



VC630/5AX – Specification of Tilting & Rotary

**ROTARY TABLE
W/APC**



◎ SPECIFICATIONS

<Standard>

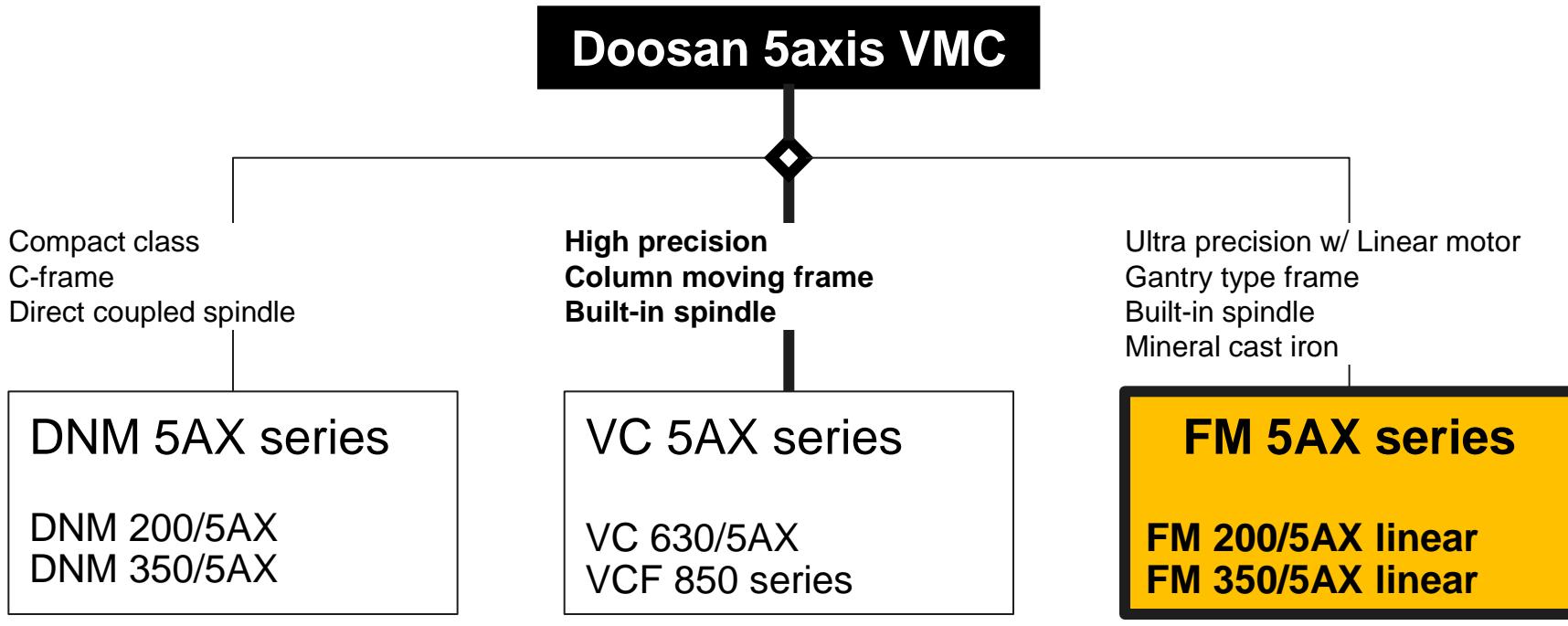
TABLE SIZE	mm	Φ630
STROKE(A / C)	° (deg)	+30° ~ -120°/360°
STROKE(A / C)	rpm	20 / 30
Indexing Accuracy (A / C)	sec.	10 / 10
MAX. WORKPIECE SIZE	mm (ΦDxH)	Φ730 x 500
MAX. WORKPIECE WEIGHT	kgf	500

<W/APC>

TABLE SIZE	mm	500 X 500
STROKE(A / C)	° (deg)	+30° ~ -120°/360°
STROKE(A / C)	rpm	20 / 30
Indexing Accuracy (A / C)	sec.	10 / 10
MAX. WORKPIECE SIZE	mm (ΦDxH)	Φ730 x 450
MAX. WORKPIECE WEIGHT	kgf	500

e 5axis VMC

Concept...



* Direct coupled spindle from 2014 mass production plan

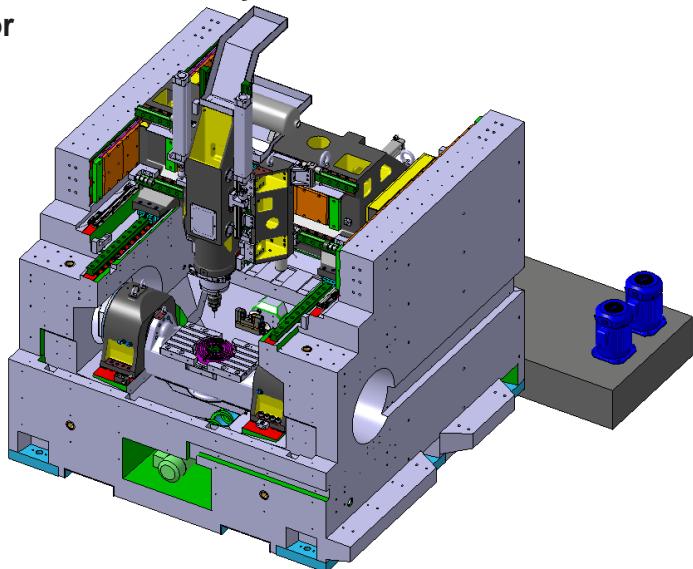
FM 5AXIS series

Rotary table dia. (mm)	Tool taper	Non simultaneous 5AX((4+1axis))			Simultaneous 5AX	
		F0iMD	F31i5	iTNC530		
200	HSK E40				FM 200/5AX linear	New
	#40	DNM 200/5AX				
350	#40		DNM 350/5AX		FM 350/5AX linear	New
	HSK E40					
500	#40					
630	#40				VC 630/5AX	

FM350/5AX linear

Concept

- High speed 5-axis machining center for small & complex die & mold parts
- Each axis is driven by linear motor / Direct drive motor



Launching / Mass production plan

- Sales launching in May. 2013

Exhibition plan

2014 : SIMTOS

Major specifications

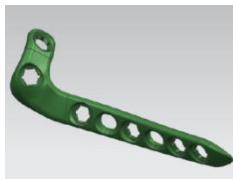
• Stroke (X/Y/Z,A/C)	400/600/350mm/240/360deg
• Table size	Φ350
• Max. Load	100kg
• Spindle speed	45000 r/min(Built in)
• Rapid traverse	80/80/80 m/min /50/100 rpm
• ATC	HSK E 40 – 40Tools
• Controller	Heidenhain iTNC530

Sales points

- Gantry structure for high speed and precision machining
- High speed axis system with linear motor & torque motor
- Mineral casting base for good vibration damping

Target customers / Application

- Precision die & mold for IT & Medical part



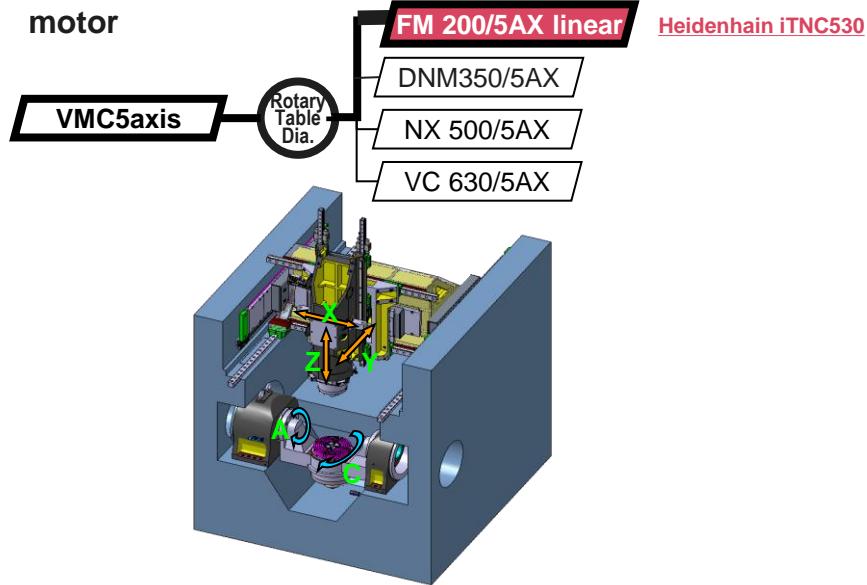
Competitors / Model

- Makino, Mikron, Exeron

FM200/5AX linear

Concept

- High speed 5-axis machining center for small & complex precision parts
- Each axis is driven by linear motor / Direct drive motor



Launching / Mass production plan

- Sales launching in Mar. 2014
- Mass production from Aug. 2014

Exhibition plan

2014 : SIMTOS

Major specifications

• Stroke (X/Y/Z/A/C)	200/340/300/-10~+130/360
• Table size	Ø200
• Max. Load	15kg
• Spindle speed	45000 r/min(Built in)
• Rapid traverse	50/50/50 m/min /100/200 rpm
• ATC	HSK E 40 – 24Tools
• Controller	Heidenhain iTNC530

Sales points

- Gantry structure for high speed and precision machining
- High speed axis system with linear motor & DD motor.
- Mineral casting base for good vibration damping

Target customers / Application

- Turbo charger Impeller, Medical parts and other precision parts



Competitors / Model

- DMG – HSC20 linear , Several Europeans